State Water Resources Control Board

Division of Water Quality

1001 I Street • Sacramento, California 95814 • (916) 341-5455
Mailing Address: P.O. Box 100 • Sacramento, California • 95812-0100
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Linda S. Adams
Secretary for
Environmental Protection

Arnold Schwarzenegger
Governor

TO: Dean C. Simeroth, Chief
Criteria Pollutants Branch

Gerald W. Bowes

FROM: Gerald W. Bowes, Ph.D.
Manager, Toxicology and Peer Review Section
DIVISION OF WATER QUALITY

DATE: January 13, 2009

SUBJECT: REQUEST FOR EXTERNAL PEER REVIEWERS FOR PROPOSED LOW CARBON FUEL STANDARD

In response to your request for peer reviewers for the subject noted above, the University of California, through an Interagency Agreement with Cal/EPA, has identified candidates it considers qualified to perform this assignment. I have reviewed the Conflict of Interest Disclosure form each candidate was required to complete and sign, and have approved four reviewers.

During the course of reviewing the disclosure forms, I contacted the candidates for clarification on certain topics. After they had provided satisfactory clarification, and confirmed they could perform an objective and independent review free of conflict of interest and bias, I informed them they were approved as reviewers. I also forwarded to them my latest (January 7, 2009) supplement to the Cal/EPA peer review guidelines, and am attaching it here for your information as well. The approved reviewers are as follows:

1. Linsey C. Marr, Ph.D.
   Associate Professor
   Civil and Environmental Engineering
   Virginia Tech
   411 Durham Hall (0246)
   Blacksburg, VA 24061

2. Denise L. Mauzerall, Ph.D..
Associate Professor
Science, Technology and Environmental Policy Program
Woodrow Wilson School of Public and International Affairs
Princeton University
406 Robertson Hall
Princeton, NJ 08544

3. John M. Reilly, Ph.D.
Associate Director for Research
MIT Joint Program in the Science and Policy of Global Change

Senior Lecturer
Sloan School of Management, E40-433 (Beginning January 28, 2009: E19-4296)
MIT, Cambridge, MA 02142

4. Valerie Thomas, Ph.D.
Anderson Interface Associate Professor
School of Industrial and Systems Engineering
School of Public Policy (Joint Appointment)
School of Earth and Atmospheric Sciences (Adjunct Appointment)
Groseclose, Room 415
Georgia Institute of Technology
Atlanta, Georgia 30332

Biographical information for the approved reviewers is provided with this memorandum.

If you intend to send material by mail, please ask them if their preferred mailing address is the same as that noted above.

Tell your reviewers when you will transmit the material. They have accepted the assignment based on the date of availability given in your letter of request to me. If preparation of the material is delayed, ask them if the new date is acceptable, including me

as a "cc." If subsequent delays occur, inform the reviewers and me as soon as possible. I am often contacted by reviewers and the University if delays occur and reviewers are not kept up to date.

Provide a cover letter to initiate the review process. Include with it your request letter to me, which provides a concise synopsis for your intended actions, and its three attachments. **Please inform them that their review must follow the guidance provided in Attachment 2.**

When the reviews have been completed, please let me know for the peer review files I keep here.

If I can provide additional help, contact me at any time during the review process.

Attachments

Supplement to Cal/EPA External Scientific Peer Review Guidelines – "Exhibit F" in Cal/EPA Interagency Agreement with University of California Gerald W. Bowes, Ph.D.

Guidance to Staff:

1. Revisions. If you have revised any part of the initial request, please stamp "Revised" on each page where a change has been made, and the date of the change. Clearly describe the revision in the cover letter to reviewers, which transmits the material to be reviewed. The approved reviewers have seen your original request letter and attachments during the solicitation process, and must be made aware of changes.

2. Documents requiring review. All important scientific underpinnings of a proposed science-based rule must be submitted for external peer review. The underpinnings would include all publications (including conference proceedings), reports, and raw data upon which the proposal is based. If there is a question about the value of a particular document, or parts of a document, I should be contacted.

3. Documents not requiring review. The Cal/EPA External Peer Review Guidelines note that there are circumstances where external peer review of supporting scientific documents is not required. An example would be "A particular work product that has been peer reviewed with a known record by a recognized expert or expert body." I would treat this allowance with caution. If you have any doubt about the quality of such external review, or of the reviewers' independence and objectivity, that work product – which could be a component of the proposal - should be provided to the reviewers.

4. Implementation review. Publications which have a solid peer review record, such as a US EPA Criteria document, do not always include an implementation strategy. The Cal/EPA Guidelines require that the implementation of the scientific components of a proposal, or other initiative, must be submitted for external review.

5. Identity of external reviewers. External reviewers should not be informed about the identity of other external reviewers. Our goal has always been to solicit truly independent comments from each reviewer. Allowing the reviewers to know the identity of others sets up the potential for discussions between them that could devalue the independence of the reviews.

6. Panel Formation. Formation of reviewer panels is not appropriate. Panels can take on the appearance of scientific advisory committees and the external reviewers identified through the Cal/EPA process are not to be used as scientific advisors.

7. Conference calls with reviewers. Conference calls with one or more reviewers can be interpreted as seeking collaborative scientific input instead of critical review. Conference calls with reviewers are not allowed.

Guidance to Reviewers from Staff:

1. Discussion of review.

   Reviewers are not allowed to discuss the proposal with individuals who participated in development of the proposal. These individuals are listed in Attachment 3 of the review request.

   Discussions between staff and reviewers are not permitted. Reviewers may request clarification of certain aspects of the review process or the documents sent to them.

   Clarification questions and responses must be in writing. Clarification questions about reviewers' comments by staff and others affiliated with the organization requesting the review, and the responses to them, also must be in writing. These communications will become part of the administrative record.

   The organization requesting independent review should be careful that organization-reviewer communications do not become collaboration, or are perceived by others to have become so. The reviewers are not technical advisors. As such, they would be considered participants in the development of the proposal, and would not be considered by the University of California as external reviewers for future revisions of this or related proposals. The statute requiring external review of science-based rules proposed by Cal/EPA organizations prohibits participants serving as peer reviewers..

2. Disclosure of reviewer Identity and release of review comments.

   Confidentiality begins at the point a potential candidate is contacted by the University of California. Candidates who agree to complete the conflict of interest disclosure form should keep this matter confidential, and should not inform others about their possible role as reviewer.

   Reviewer identity may be kept confidential until review comments are received by the organization that requested the review. After the comments are received, reviewer identity and comments must be made available to anyone requesting them.

   Reviewers are under no obligation to disclose their identity to anyone enquiring. It is recommended reviewers keep their role confidential until after their reviews have been submitted.

3. Requests to reviewers by third parties to discuss comments.

   After they have submitted their reviews, reviewers may be approached by third parties representing special interests, the press, or by colleagues. Reviewers are under no obligation to discuss their comments with them, and we recommend that they do not.

   All outside parties are provided an opportunity to address a proposed regulatory action during the public comment period and at the Cal/EPA organization meeting where the proposal is considered for adoption. Discussions outside these provided avenues for comment could seriously impede the orderly process for vetting the proposal under consideration.

4. Reviewer contact information.

The reviewer's name and professional affiliation should accompany each review. Home address and other personal contact information are considered confidential and should not be part of the comment submittal.

Linsey C. Marr

411 Durham Hall (0246)
Blacksburg, VA 24061

Education

Ph.D. **University of California at Berkeley**, Civil and Environmental Engineering, 2002

Changes in ozone sensitivity to precursor emissions on multiple time scales

Minor areas of study: Mathematics, Public Health

B.S. **Harvard**, Engineering Science, *Summa cum laude*, 1996

Academic Appointments

2008 – present **Associate Professor**
Civil and Environmental Engineering
Virginia Tech

2003 – 2008 **Assistant Professor**
Civil and Environmental Engineering
Virginia Tech

2002 – 2003 **Postdoctoral Associate**
Earth, Atmospheric, and Planetary Sciences
Massachusetts Institute of Technology

Awards and Honors

- Virginia Tech College of Engineering Faculty Fellow, 2007
- National Science Foundation CAREER, 2006
- Virginia Tech College of Engineering Outstanding New Assistant Professor, 2006
- US Environmental Protection Agency STAR Graduate Research Fellowship, 1999-2002
- National Science Foundation Graduate Research Fellowship, 1996-1999
- Outstanding Graduate Student Instructor, University of California at Berkeley, 1999

Teaching Experience

I have taught courses at the undergraduate and graduate level in air quality engineering and an introductory course in environmental engineering. I strive to be an excellent teacher. My teaching ratings have been least 3.7 (4 = excellent, 3 = good, 2 = fair, 1 = poor) over the past three years.

Assistant Professor, Virginia Tech, Blacksburg
CEE 2804: Introduction to Civil and Environmental Engineering, 2005
CEE 3104: Introduction to Environmental Engineering, 2003 – present
CEE 4144: Air Resources Engineering, 2004 – present
CEE 5154: Air Pollution Control Engineering, 2003 – present

Teaching Assistant, University of California at Berkeley
CE 218A: Air Quality Engineering, 1998

Head Teaching Assistant or Teaching Assistant, Harvard
CS 50: Computer Programming, 1995
ES 96: Engineering Design Project, 1996
ES 123: Fluid Mechanics, 1995

PUBLICATIONS

1. Schweitzer, L.A., **Marr, L.C.**, Linford, J.C., Darby, M.A., (2008). The Sustainable Mobility Learning Laboratory: Interactive web-based education on transportation and the environment, *Applied Environmental Education and Communication*, 7, 20-29.
2. Thornhill, D.A., de Foy, B., Herndon, S.C., Onasch, T.B., Wood, E.C., Zavala, M., Molina, L.T., Gaffney, J.S., Marley, N.A., **Marr, L.C.**, (2008). Particulate polycyclic aromatic hydrocarbon spatial variability and aging in Mexico City, *Atmospheric Chemistry and Physics*, 8, 3093-3105.
3. Yeganeh, B., Kull, C.M., Hull, M.A., **Marr, L.C.**, (2008). Characterization of airborne particles during production of carbonaceous nanomaterials, *Environmental Science and Technology*, 42, 4600-4606.
4. Andersen, R.G., Booth, E.C., **Marr, L.C.**, Widdowson, M.A., Novak, J.T., (2008). Volatilization and biodegradation of naphthalene in the vadose zone impacted by phytoremediation, *Environmental Science and Technology*, 42, 2575-2581.
5. Sheesley, R.J., Schauer, J.J., Smith, T.J., Garshick, E., Laden, F., **Marr, L.C.**, Molina, L.T., (2008). Assessment of diesel particulate matter exposure in the workplace: freight terminals, *Journal of Environmental Monitoring*, 10, 305-314.
6. Dzepina, K., Arey, J., **Marr, L.C.**, Worsnop, D.R., Salcedo, D., Zhang, Q., Onasch, T.B., Molina, L.T., Molina, M.J., Jimenez, J.L., (2007). Detection of particle-phase polycyclic aromatic hydrocarbons in Mexico City using an Aerosol Mass Spectrometer, *International Journal of Mass Spectrometry*, 263, 152-170.
7. **Marr, L.C.**, Booth, E.C., Andersen, R.G., Widdowson, M.A., Novak, J.T., (2006). Direct volatilization of naphthalene to the atmosphere at a phytoremediation site, *Environmental Science and Technology*, 40, 5560-5566.
8. **Marr, L.C.**, Dzepina, K., Jimenez, J.L., Reisen, F., Bethel, H.L., Arey, J., Gaffney, J.S., Marley, N.A., Molina, L.T., Molina, M.J., (2006). Sources and transformations of particle-bound polycyclic aromatic hydrocarbons in Mexico City, *Atmospheric Chemistry and Physics*, 6, 1733-1745.

9. Zavala, M., Herndon, S.C., Slott, R.S., Dunlea, E.J., **Marr, L.C.**, Shorter, J.H., Zahniser, M., Knighton, W.B., Rogers, T.M., Kolb, C.E., Molina, L.T., Molina, M.J., (2006). Characterization of on-road vehicle emissions in the Mexico City Metropolitan Area using a mobile laboratory in chase and fleet average measurement modes during the MCMA-2003 field campaign, *Atmospheric Chemistry and Physics*, 6, 5129-5142.

10. Salcedo, D., Onasch, T.B., Dzepina, K., Canagaratna, M.R., Zhang, Q., Huffman, J.A., DeCarlo, P.F., Jayne, J.T., Mortimer, P., Worsnop, D.R., Kolb, C.E., Johnson, K.S., Zuberi, B., **Marr, L.C.**, Volkamer, R., Molina, L.T., Molina, M.J., Cardenas, B., Bernabé, R.M., Márquez, C., Gaffney, J.S., Marley, N.A., Laskin, A., Shutthanandan, V., Xie, Y., Brune, W., Lesher, R., Shirley, T., Jimenez, J.L., (2006). Characterization of ambient aerosols in Mexico City during the MCMA-2003 campaign with Aerosol Mass Spectrometry: results from the CENICA Supersite, *Atmospheric Chemistry and Physics*, 6, 925-946.

11. Jiang, M., **Marr, L.C.**, Dunlea, E.J., Herndon, S.C., Jayne, J.T., Kolb, C.E., Knighton, W.B., Rogers, T.M., Zavala, M., Molina, L.T., Molina, M.J., (2005). Mobile laboratory measurements of black carbon, polycyclic aromatic hydrocarbons and other vehicle emissions in Mexico City, *Atmospheric Chemistry and Physics*, 5, 3377-3387.

12. Herndon, S., Onasch, T., Frank, B., **Marr, L.**, Jayne, J., Canagaratna, M., Lanni, T., Anderson, B., Worsnop, D., Miake-Lye, R., (2005). Particulate emissions from in-use commercial aircraft, *Aerosol Science and Technology*, 39, 799–809.

13. Harley, R.A., **Marr, L.C.**, Lehner, J.K., Giddings, S.N., (2005). Changes in motor vehicle emissions on diurnal to decadal time scales and effects on atmospheric composition, *Environmental Science and Technology*, 39, 5356-5362.

14. **Marr, L.C.**, Grogan, L.A., Wohrnschimmel, H., Molina, L.T., Molina, M.J., Smith, T.J., Garshick, E., (2004). Vehicle traffic as a source of particulate polycyclic aromatic hydrocarbon exposure in the Mexico City Metropolitan Area, *Environmental Science and Technology*, 38, 2584-2592.

15. **Marr, L.C.**, Harley, R.A., (2002). Modeling the effect of weekday-weekend differences in motor vehicle emissions on photochemical air pollution in central California, *Environmental Science and Technology*, 36, 4099-4106.

16. **Marr, L.C.**, Harley, R.A., (2002). Spectral analysis of ambient ozone, nitrogen oxide, and non-methane hydrocarbon time series in California, *Atmospheric Environment*, 36, 2327-2335.

17. **Marr, L.C.**, Black, D.R., Harley, R.A., (2002). Formation of photochemical air pollution in central California. 1. Development of a revised motor vehicle emission inventory, *Journal of Geophysical Research*, 107, Art. no. 4047.

18. **Marr, L.C.**, Noblet, G.S., Harley, R.A., (2002). Formation of photochemical air pollution in central California. 2. Evaluation of an Eulerian model, *Journal of Geophysical Research*, 107, Art. no. 4048.

19. Yi, C., Davis, K.J., Bakwin, P.S., Berger, B., **Marr L.C.**, (2000). The influence of advection on measurements of the net ecosystem-atmosphere exchange of CO_2 from a very tall tower, *Journal of Geophysical Research*, 105, 9991-9999.

20. **Marr, L.C.**, Kirchstetter, T.W., Harley, R.A., Miguel, A.H., Hering, S.V., Hammond, S.K., (1999). Characterization of polycyclic aromatic hydrocarbons in motor vehicle fuels and exhaust emissions, *Environmental Science and Technology*, 33, 3091-3099.
21. Wills, Z., **Marr, L.**, Zinn, K., Goodman, C.S., Van Vactor, D., (1999). Profilin and the Abl tyrosine kinase are required for motor axon outgrowth in the Drosophila embryo, *Neuron*, 22, 291-299.
22. **Marr, L.C.**, Morrison, G.C., Nazaroff, W.W., Harley, R.A., (1998). Reducing the risk of death due to vehicle-related accidental carbon monoxide poisoning, *Journal of the Air and Waste Management Association*, 48, 899-906.
23. Page, E., Siminovitch, M., **Marr, L.**, Mitchell, J., (1998). Energy efficient alternatives to halogen torchieres, *Journal of the Illumination Engineering Society*, 27, 28-32.

CONFERENCE PRESENTATIONS

1. Li, L., Arogo Ogejo, J., **Marr, L.C.**, Knowlton, K.F., Hanigan, M.D., Gay, S.W., Ammonia emissions from dairy storage tanks, American Society of Agricultural and Biological Engineers Annual International Meeting (29 June-2 July 2008, Providence, RI).
2. Hull, M.S., **Marr, L.**, NANOSAFE: A practical nanotechnology EHS management framework, ESTECH 2008 (4-7 May 2008, Chicago, IL).
3. **Marr, L.C.**, Thornhill, D.A., Herndon, S.C., Onasch, T.B., Wood, E.C., Jayne, J.T., Kolb, C.E., Knighton, W.B., Mazzoleni, C., Zavala, M.A., Molina, L.T., New approaches for estimating motor vehicle emissions in megacities, American Geophysical Union Fall Meeting (10-14 December 2007, San Francisco, CA), Abstract A13I-03.
4. **Onasch, T.B.**, Slowik, J.G., Davidovits, P., Herndon, S., Wood, E., Canagaratna, M., Worsnop, D., Kolb, C.E., Knighton, B., Zavala, M., Thornhill, D., Marr, L., Arnott, P., Mazzoleni, C., Dubey, M.K., Hopkins, R., Gilles, M.K., Desyaterik, Y., Laskin, A., Kroll, J., Carbonaceous aerosol processing in the Mexico City Metropolitan Area, American Geophysical Union Fall Meeting (10-14 December 2007, San Francisco, CA), Abstract A24C-06.
5. **Marr, L.C.**, Thornhill, D.A., Jiang, M., Dzepina, K., Jimenez, J.L., Arey, J., Herndon, S.C., Onasch, T.B., Wood, E.C., Jayne, J.T., Kolb, C.E., Knighton, W.B., Zavala, M.A., Molina, L.T., Megacity polycyclic aromatic hydrocarbon exposure, emissions, and transformations in Mexico City, American Association for Aerosol Research 26th Annual Conference (24-28 September 2007, Reno, NV).
6. Dzepina, K., Jimenez, J.L., Arey, J., **Marr, L.C.**, Worsnop, D.R., Onasch, T.B., Salcedo, D., Detection of particle-phase polycyclic aromatic hydrocarbons in Mexico City using an aerosol mass spectrometer, American Association for Aerosol Research 26th Annual Conference (24-28 September 2007, Reno, NV).
7. **Marr, L.C.**, Thornhill, D.A., Jiang, M., Dzepina, K., Jimenez, J.L., Arey, J., Herndon, S.C., Onasch, T.B., Wood, E.C., Jayne, J.T., Kolb, C.E., Knighton, W.B., Zavala, M., Molina, L.T., Megacity polycyclic aromatic hydrocarbon exposure, emissions, and transformations in Mexico City, Association of Environmental Engineering and Science Professors (AEESP) Education and Research Conference (29-31 July 2007, Blacksburg, VA).

8. Rahka, H., Park, S., **Marr, L.C.**, Olin, R., 2006, Solutions for enhancing remote sensing high emitter vehicle screening procedures, Transportation Research Board 86th Annual Meeting (21-25 January 2007, Washington, DC).
9. Yeganeh Talab, B., **Marr, L.C.**, Duncan, L.K., Vikesland, P.J., Aerosolization of fullerenes for health and environmental studies, International Aerosol Conference (10-15 September 2006, St. Paul, MN).
10. **Marr, L.C.**, Yeganeh Talab, B., Kull, C.M., Hull, M.S., Dorn, H.C., Exposure to airborne nanoparticles in the nanotechnology workplace, International Aerosol Conference (10-15 September 2006, St. Paul, MN).
11. Dzepina, K., Jimenez, J.L., **Marr, L.C.**, Arey, J., Worsnop, D.R., Salcedo, D., Zhang, Q., Molina, L.T., Molina, M.J., Detection of particle-phase polycyclic aromatic hydrocarbons in Mexico City using an aerosol mass spectrometer, International Aerosol Conference (10-15 September 2006, St. Paul, MN).
12. Duncan, L.K., Vikesland, P.J., Yeganeh, B., **Marr, L.**, Jinschek, J., Formation and behavior of aqueous fullerene solutions, American Chemical Society 232nd National Meeting and Exposition (10-14 September 2006, San Francisco, CA).
13. **Marr, L.C.**, Kull, C.M., Dorn, H.C., Hull, M.S., Exposure to nanoparticles in the nanotechnology workplace, Overcoming Obstacles to Effective Research Design in Nanotoxicology (24-25 April 2006, Cambridge, MA).
14. Herndon, S., Onasch, T., Jayne, J., Wood, E., Yelvington, P., Wormhoudt, J., Northway, M., Mortimer, P., Worson, D., Zahniser, M., Nelson, D., Shorter, J., McManus, B., Knighton, B., Anderson, B., We, C.-L., **Marr, L.**, Whitefield, P., Miake-Lye, R., Aircraft emissions characterization, Gordon Research Conference on Atmospheric Chemistry (4-9 September 2005, Big Sky, MT).
15. **Marr, L.C.**, Dzepina, K., Jimenez, J.L., Riesen, F., Bethel, H.L., Arey, J., Gaffney, J.S., Marley, N.A., Molina, L.T., Molina, M.J., Intercomparison of Three Measurement Methods for Polycyclic Aromatic Hydrocarbons in Mexico City, Gordon Research Conference on Atmospheric Chemistry (4-9 September 2005, Big Sky, MT).
16. Andersen, R.G., Booth, E.C., Nelson, M., **Marr, L.C.**, Widdowson, M.A., Novak, J.T., Phytovolatilization and bioremediation of naphthalene at a creosote-contaminated phytoremediation site, The Eighth International In-Situ and On-Site Bioremediation Symposium (6-9 June 2005, Baltimore, MD).
17. **Marr, L.C.**, Jiang, M., Dunlea, E., Herndon, S., Jayne, J., Rogers, T., Knighton, B., Zavala, M., Molina, L.T., Molina, M.J., Using a Mobile Laboratory to Estimate Mexico City's Emission Inventory, 15th Coordinating Research Council On-Road Vehicle Emissions Workshop (4-6 April 2005, San Diego, CA).
18. Harley, R.A., **Marr, L.C.**, Lehner, J.K., Giddings, S.N., Changes in motor vehicle emissions on diurnal to decadal time scales and effects on atmospheric composition, 15th Coordinating Research Council On-Road Vehicle Emissions Workshop (4-6 April 2005, San Diego, CA).
19. Jiang, M., **Marr, L.C.**, Dunlea, E., Herndon, S., Jayne, J., Rogers, T., Knighton, B., Zavala, M., Molina, L.T., Molina, M.J., Mobile laboratory measurements of black carbon and polycyclic aromatic hydrocarbon emissions in Mexico City: a new method for motor vehicle

emission inventory calculations, American Geophysical Union Fall Meeting (13-17 December 2004, San Francisco, CA).

20. **Marr, L.C.**, Dzepina, K., Jimenez, J.L., Bethel, H.L., Reisen, F., Arey, J., Gaffney, J.S., Marley, N.A., Shirley, T., Brune, W.H., Molina, L.T., Molina, M.J., Concentrations, sources, and transformation of particulate polycyclic aromatic hydrocarbons in Mexico City, American Geophysical Union Fall Meeting (13-17 December 2004, San Francisco, CA).
21. **Marr, L.C.**, Harley, R.A., Weekly and decadal changes in NO_x emissions and tropospheric ozone, American Geophysical Union Fall Meeting (13-17 December 2004, San Francisco, CA).
22. Jimenez, J.L., Zhang, Q., Dunn, M., DeCarlo, P., Huffman, A., Salcedo, D., Onasch, T., Worsnop, D.R., Kolb, C.E., Mortimer, P., Jayne, J.T., Canagaratna, M.R., Volkamer, R., de Foy, B., Johnsono, K., Zuberi, B., Frey, S., Molina, M., Molina, L., **Marr, L.**, Arey, J., Cardenas, B., Brune, B., Smith, J., McMurry, P., Gaffney, J., Marley, N., Overview of measurements of particle emissions and ambient concentrations in Mexico City during the MCMA-2003 campaign, American Geophysical Union Fall Meeting (13-17 December 2004, San Francisco, CA).
23. Zavala, M., Dunlea, E., **Marr, L.**, Slott, R.S., Molina, L.T., Molina, M.J., Herndon, S.C., Jayne, J.T., Shorter, J.H., Worsnop, D., Zahniser, M., Onasch, T., Kolb, C.E., Knighton, B., Heavy-duty vehicle emissions in the Mexico City Metropolitan Area during the MCMA-2003 field measurement campaign, American Geophysical Union Fall Meeting (13-17 December 2004, San Francisco, CA).
24. Onasch, T.B., Worsnop, D.R., Canagaratna, M., Jayne, J.T., Herndon, S., Mortimer, P., Kolb, C.E., Knighton, B., Dunlea, E., **Marr, L.**, de Foy, B., Molina, M., Molina, L., Salcedo, D., Dzepina, K., Jimenez, J.L., Variability of ambient aerosol in the Mexico City Metropolitan Area, American Geophysical Union Fall Meeting (13-17 December 2004, San Francisco, CA).
25. Harley, R.A., **Marr, L.C.**, Impact of increased nitrogen oxide emissions from diesel engines on regional atmospheric chemistry, American Geophysical Union Fall Meeting (8-12 December 2003, San Francisco, CA).
26. Jayne, J., Herndon, S., Knighton, B., Onasch, T., Mortimer, P., Canagaratna, M., Dunlea, E., **Marr, L.**, Kolb, C., Jimenez, J., Worsnop, D. Use of a mobile laboratory to characterize in – use vehicle and other emissions in the Mexico City area, American Association for Aerosol Research Conference (20-24 October 2003, Anaheim, CA).
27. Jimenez, J.L., Dzepina, K., DeCarlo, P., Huffman, A., Zhang, Q., Salcedo, D., Jayne, J.T., Worsnop, D. R., Canagaratna, M., Onasch, T.B., Mortimer, P., **Marr, L.C.**, Molina, L.T., Molina, M., Gaffney, J.S., Marley, N.A. Size, time, and composition-resolved aerosol measurements in Mexico City during the MCMA-2003 field campaign, American Association for Aerosol Research (20-24 October 2003, Anaheim, CA).
28. Harley, R.A., **Marr, L.C.**, Impact of increased nitrogen oxide emissions from diesel engines on regional atmospheric chemistry, Gordon Research Conference on Atmospheric Chemistry (8-11 September 2003, Big Sky, MT).

29. Jimenez, J.L., Dzepina, K., DeCarlo, P., Huffman, A., Zhang, Q., Salcedo, D., Onasch, T.B., Mortimer, P., Jayne, J.T., Canagaratna, M., Worsnop, D.R., Smith, J., McMurry, P., Baumgardner, D., Castro, T., Gaffney, J., Marley, N., Martinez, A.P., Volkamer, R., Johnson, K., **Marr, L.**, Molina, M., Molina, L.T., Size, time, and composition-resolved aerosol measurements in Mexico City during the MCMA-2003 field campaign, Gordon Research Conference (8-11 September 2003, Big Sky, MT).

30. **Marr, L.C.**, Increase in diesel contribution to on-road vehicle NO_x emissions and influence on the weekend ozone effect, 12th Coordinating Research Council On-Road Vehicle Emissions Workshop (15-17 April **2002**, San Diego, CA).

31. **Marr L.C.**, Miguel, A.H., Kirchstetter T.W., Harley R.A., Hering S.V., Hammond S.K., Real-world emissions of PAH in the exhaust of California reformulated gasoline- and heavy duty diesel-fueled vehicles, 5th International Aerosol Conference (14-18 September 1998, Edinburgh, Scotland).

32. **Marr L.C.**, Morrison G.C., Nazaroff W.W., Harley R.A., Reducing the risk of death due to vehicle-related accidental carbon monoxide poisoning, International Society for Environmental Epidemiology and International Society for Exposure Analysis Conference (16-19 August 1998, Boston, MA).

INVITED PRESENTATIONS AND SEMINARS

1. Marr, L.C., Megacity Polycyclic Aromatic Hydrocarbon Exposure, Emissions, and Transformations in Mexico, Department of Civil and Environmental Engineering, Washington State University, 2008.
2. Marr, L.C., Megacity Polycyclic Aromatic Hydrocarbon Exposure, Emissions, and Transformations in Mexico, Department of Civil and Environmental Engineering, University of Washington, 2007.
3. Marr, L.C., Megacity Polycyclic Aromatic Hydrocarbon Exposure, Emissions, and Transformations in Mexico, Department of Civil and Environmental Engineering, Duke University, 2007.
4. Marr, L.C., Megacity Polycyclic Aromatic Hydrocarbon Exposure, Emissions, and Transformations in Mexico, Department of Civil and Environmental Engineering, Rice University, 2007.
5. Marr, L.C., Carbonaceous nanoparticles: exposure and cross-media environmental fate, Atlantic Nano Forum, Alexandria, Virginia, 2007.
6. Marr, L.C., Engineering a sustainable atmosphere: from nano to micro to mega, Department of Civil and Environmental Engineering, University of California at Berkeley, 2007.
7. Marr, L.C., Engineering a sustainable atmosphere: from nano to micro to mega, Department of Civil and Environmental Engineering, University of California at Davis, 2007.
8. Marr, L.C., Quantification of air pollutant emissions over multiple spatial scales: from cow pies to cities, Department of Biological Systems Engineering, Virginia Tech, 2006.

9. Marr, L.C., Harley, R.A., Weekly and decadal changes in NO_x emissions and tropospheric ozone, American Geophysical Union Fall Meeting (San Francisco, CA), 13-17 December 2004.
10. Marr, L.C., Diurnal, weekly, and decadal changes in photochemical air pollution, Department of Mechanical Engineering, University of California at San Diego, 2002.
11. Marr, L.C., Diurnal, weekly, and decadal changes in photochemical air pollution, Department of Civil and Environmental Engineering, Virginia Tech, 2002.
12. Marr, L.C., Diurnal, weekly, and decadal changes in photochemical air pollution, Department of Geography and Environmental Engineering, Johns Hopkins, 2002.
13. Marr, L.C., Diurnal, weekly, and decadal changes in photochemical air pollution, Department of Civil and Environmental Engineering, Rice University, 2002.
14. Marr, L.C., Diurnal, weekly, and decadal changes in photochemical air pollution, Atmospheric Sciences, Harvard University, 2002.
15. Marr, L.C., The weekend ozone effect in central California, Department of Civil and Environmental Engineering, Carnegie Mellon, 2000.

SPONSORED RESEARCH

PIs	Project title	Source	Role and share	Total amount	Dates
Marr, L.C.	REU: Measurement of Air Pollutant Emissions	National Science Foundation	PI 100%	$6,990	5/07-8/07
Waldon, J. Klopfer, S.D. Galbraith, J. **Marr, L.** Schoenholtz, S.	Assessment of Natural Resources and Watershed Conditions for Four NPS Units in the Southeastern Coastal Network of Parks	National Park Service	Co-PI 20%	$126,495	6/07-3/09
Marr, L.C.	CAREER: New Methods for the Direct Quantification of Air Pollutant Emissions and Education of the Next Generation of Engineers	National Science Foundation	PI 100%	$400,000	5/06-5/11
Marr, L.C.	Improved Quantification of Particulate Emissions from Motor Vehicles in Mexico City	Molina Center for Energy and the Environment	PI 100%	$18,117	1/06-8/07
Gay, S.W. **Marr, L.C.** Hannigan, M.D. Knowlton, K.F. Ogejo, J.A.	Effects of Dietary Nitrogen Manipulation on Ammonia Emissions from Housing and Manure Storage Facilities	United States Department of Agriculture	Co-PI 20%	$499,531	1/06-12/08
Marr, L.C. Schweitzer, L.A.	SHENAIR: Modeling Air Quality in the Shenandoah Valley	National Oceanographic and Atmospheric Administration	PI 70%	$145,998	1/06-12/08
Marr, L.C. Vikesland, P.V. Dorn, H.C.	Cross-Media Environmental Transport, Transformation, and Fate of Manufactured Carbonaceous Nanomaterials	National Science Foundation	PI 48%	$350,000	9/05-8/08
Little, J.C. **Marr, L.C.**	Emission of Phthalates from Vinyl Flooring and Interaction with Fine Particles	National Science Foundation	Co-PI 50%	$396,391	9/05-8/08

Schweitzer, L.A. **Marr, L.C.**	Sustainable Mobility Learning Laboratory	American Honda Foundation	Co-PI 50%	$78,986	9/05-8/06
Marr, L.C.	Analysis Of Photochemistry In Power Plant And Petrochemical Industry Plumes	National Oceanographic and Atmospheric Administration	PI 100%	$6,000	3/05-10/05
Marr, L.C.	Analysis of Motor Vehicle Particulate Emissions in Mexico City	U.S.-Mexico Foundation for Science	PI 100%	$30,000	8/03-5/05
Marr, L.C.	Measurement of Urban Air Pollutant Emissions	AdvanceVT-National Science Foundation	PI 100%	$19,305	8/04-8/05
Marr, L.C.	A Nanoparticle Laboratory for Environmental and Public Health Research	Virginia Tech ASPIRES	PI 100%	$133,426	5/05-6/06

GRADUATE STUDENTS

	Name	Degree	Date	Dissertation/thesis/project title
1	Miskovic, I.	Ph.D.	2011	Oxidation of nC_{60} Fullerene Nanoparticles by Ozone and Cross-Media Impacts on Fate and Transport
2	Moore, T.O.	Ph.D.	2009	Air Pollutant Emissions Measured by Eddy Covariance
3	Dunker, A.J.	M.S.	2009	Enhancement of Diethylhexylphthalate (DEHP) Emissions from Building Materials due to Partitioning to Particles
4	Bansal, G.	M.S.	2008	Sensitivity of Ozone and Fine Particulate Matter to Local Emissions in the Shenandoah Valley
5	Sparks, J.A.	M.S.	2008	Minimizing Ammonia Emissions from Dairy Cow Manure
6	Thornhill, D.A.	M.S.	2007	Sources, Transport, and Transformation of Particulate Polycyclic Aromatic Hydrocarbons in Mexico City
7	Yeganeh, B.	M.S.	2007	Exposure to and Environmental Fate of Aerosolized Nanoparticles
8	Kull, C.M.	M.S.	2005	Characterization of Airborne Nanoparticles in a Manufacturing Facility
9	Booth, E.C.	M.S.	2005	Volatilization of Naphthalene at a Creosote-Contaminated Site
10	Jiang, M.	M.S.	2005	Mobile Laboratory Measurement of Black Carbon, Particulate Polycyclic Aromatic Hydrocarbons and Other Exhaust Emissions in Mexico City

PROFESSIONAL ACTIVITIES

- Member of American Association of Aerosol Research, American Geophysical Union, American Society of Environmental Engineering Professors
- Reviewer for the Environmental Protection Agency, the National Science Foundation, *Aerosol Science and Technology, Atmospheric Chemistry and Physics, Atmospheric Environment, Atmospheric Research, Environmental Science and Technology, Journal of Applied Meteorology and Climatology, Journal of Environmental Informatics, Journal of Geophysical Research, Journal of the Air and Waste Management Association*

DENISE L. MAUZERALL
PRINCETON UNIVERSITY
WOODROW WILSON SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS
SCIENCE, TECHNOLOGY AND ENVIRONMENTAL POLICY PROGRAM
PRINCETON, NJ 08544

EDUCATION

Harvard University
Ph.D., Atmospheric Chemistry, Earth and Planetary Science Department, 1996
Dissertation: Influence of fossil fuel combustion and biomass burning on tropospheric ozone.
Advisor: Professor Daniel J. Jacob
M.A., Atmospheric Chemistry, Earth and Planetary Science Department, 1992

Stanford University
M.S., Environmental Engineering, 1988

Brown University
Sc.B., with honors, Chemistry, 1985

PROFESSIONAL EXPERIENCE

Princeton University
Associate Professor of Public and International Affairs (with tenure), Woodrow Wilson School of Public and International Affairs (2006 - present)
Assistant Professor of Public and International Affairs, Woodrow Wilson School (1999 - 2006)
Affiliate faculty, Geosciences Department (1999 - present)
Affiliate faculty, Princeton Environmental Institute (1999 - present)
Affiliate faculty, Civil and Environmental Engineering Department (2003 - present)

National Center for Atmospheric Research, Boulder, CO
Visiting Scientist, Atmospheric Chemistry Division (Summer 1999)
Post-doctoral Fellow, Advanced Study Program (1996-1998)

United States Environmental Protection Agency, Washington D.C.
Program Manager, Global Change Division (1989-1990)

Environmental Consulting
Chief Environmental Engineer, Bruce Company, Washington D.C. (1988-1989)
Chemist, ICF Technology Inc., Washington D.C. (1985-1987)

GRANTS (principle investigator)

Regional Contributions to the Global Tropospheric Ozone Budget – Global Modeling and Data Analysis, NASA Atmospheric Chemistry Modeling and Analysis Program.
(July 2000 – July 2004)

Inter-annual Variability in Trans-Pacific Transport of Pollution, NASA New Investigators Program. (September 2002 – August 2007)

Air Pollution Damages in the United States, Glaser Progress Foundation via collaborative contract award with Yale University. (June 2003 - July 2006)

HONORS

Intergovernmental Panel on Climate Change (IPCC) contributing author. The IPCC shared the Nobel Peace Prize with Vice President Al Gore. (2007)
Executive Committee, Cooperative Institute for Climate Science, Princeton University and NOAA Geophysical Fluid Dynamics Laboratory (2006 -)
National Research Council / National Academy of Science, Committee on Air Quality Management in the United States. (2/2001- 4/2004)
Science Steering Committee, International Geosphere Biosphere Program (IGBP), Analysis, Integration and Modeling of the Earth System (including human impacts). (2005 -)
NASA New Investigators Program grant. (2002-2006)
Advanced Study Program Postdoctoral Fellowship, NCAR. Provided 2 years of unconstrained research funding. (1996-1998)
AAAS Congressional Science Fellowship (declined). (1996)
NASA Graduate Student Fellowship in Global Change Research Provided stipend, research and travel funds for 3 years of doctoral research. (1993-1996)
Invited participant, Atmospheric Chemistry Conference for Emerging Senior Scientists. (ACCESS) and Gordon Conference in Atmospheric Chemistry. (June 1995)
Harvard University Certificate of Distinction in Teaching. (1992 - 1993)
Harvard University Levinson Teaching Award nomination. (1993)
Graduate Student Fellowship, U.S. Dept. of Education, tuition and stipend. (1991 - 1993)
Stanford University School of Engineering Fellowship, tuition. (1987 - 1988)
Elected to Sigma Xi. (1985)
Sc.B. awarded with departmental honors, Brown University. (1985)

TEACHING

Princeton University, Woodrow Wilson School of Public and International Affairs

WWS402d Development of Policy Initiatives for the Sustainable Use of Energy at Princeton University (Spring 2007)
WWS402e Sustainable Development – Can We Do It? (Spring 2003)
WWS402e Air Pollution, Climate Change and Energy: How China Matters (Spring 2001)
WWS402f Air Pollution in India and China: Thinking Globally, Acting Locally (Spring 2000)
WWS475 Global Environmental Issues (Spring 2003, Spring 2005, Fall 2005)

WWS584 The Use of Science in Environmental Policy (Fall 2004)
WWS586eGlobal Environmental Issues: Science and Policy (Spring 2005)
WWS588 Issues in Science, Technology and Environmental Policy (Spring 1999)
WWS589 Methods in Science, Technology and Environmental Policy (Fall 1999, 2000 & 2002)
WWS591a Policy Workshop: Climate Change, State initiatives, and Coastal Hazards: Mitigation and Adaptation Strategies for New Jersey (Fall 2006)
WWS591d Environmental Diplomacy (with Mr. Daniel Reifsnyder) Policy (Fall 1999)

Doctoral Students (primary adviser)
Xiaoping Wang (Ph.D. 2004);
Junfeng Liu, G5;
Eri Saikawa, G1.

Harvard University, Harvard College, Teaching Fellow
Environmental Science and Public Policy, Profs. M.B. McElroy and W. Clark (Fall and Spring 1993)
Atmospheric Chemistry, Department of Earth and Planetary Science, Prof. D.J. Jacob (Spring 1992)
The Atmosphere, Undergraduate core program, Professor M.B. McElroy (Fall 1991)

Brown University, Department of Chemistry, Teaching Assistant
Honors Chemistry. First year honors course, Professor P. Rieger (Fall 1983)

ADMINISTRATIVE RESPONSIBILITIES AT PRINCETON

Chair, Science, Technology and Environmental Policy program (1999 - 2000)
Chair, STEP Doctoral Program (1999 - 2001)
Woodrow Wilson School Senior Thesis Prize Committee (1999, 2000)
Masters of Public Policy, Admissions Committee, WWS (1999, 2000)
Masters of Public Affairs Admissions Committee, WWS (2002, 2003, 2005, 2006)
University Committee on Libraries and Computing (2002 - 2005)
Woodrow Wilson School undergraduate committee (2006,2007)
Faculty fellow, Mathey College (2003 - present)

PROFESSIONAL ACTIVITIES

Journal Referee
Science; Journal of Geophysical Research - Atmospheres; Geophysical Research Letters; Atmospheric Environment; Environmental Science and Technology; Annual Review of Energy and the Environment; Environmental Management; Journal of Atmospheric Science; Journal of Atmospheric Chemistry; Atmospheric Chemistry and Physics.

Grant Reviewer
National Aeronautic and Space Association (NASA);
National Science Foundation (NSF);
Research Grants Council of Hong Kong.

Book Reviewer
Prentice-Hall; Princeton University Press.

Media Mentions
Washington Post, Link from Weather to Pollution, May 9, 2005
CESifo Press Service, Taxing the ObNOXoius, May 23, 2005
Highlights 2005, Bringing Science to Bear on Pollution Policy, UCAR.
Conference Session Chair, Megacities, Air Pollution over Asia, International Association of Meteorology and Atmospheric Sciences, Beijing, China (August 2005)
Controlling Emissions of Non-CO2 Greenhouse Gases: Scientific and Policy Challenges, Joint Assembly meeting, New Orleans, LA (May 2005)
Integrated Assessment, Air Pollution as a Climate Forcing: a second workshop, Honolulu, Hawaii (April 2005)
Atmospheric Modeling and Dynamics session, Spring American Geophysical Union meeting, Boston, MA (May 2001)
Air Quality and Climate Change Working Group, Aspen Global Change Institute, Aspen, CO (August 2000)
Tropospheric Photochemistry and Ozone Budget session, International Symposium on Atmospheric Chemistry and the Future Global Environment, Nagoya, Japan (November, 1997)

PUBLICATIONS (Peer Reviewed)

Liu, J., D. L. Mauzerall, Evaluating the potential influence of inter-continental transport of sulfate aerosols on air quality, Environmental Research Letters, in press July 2007.

Liu, J., D. L. Mauzerall, L. W. Horowitz, Source-Receptor Relationships of Trans-Pacific Transport of East Asian Sulfate, Geophys. Res. Lett., submitted 2007.

Naik, V., D. L. Mauzerall, L. W. Horowitz, M. D. Schwarzkopf, V. Ramaswamy, M. Oppenheimer, "Sensitivity of Radiative Forcing from Biomass Burning Aerosols and Ozone to Emission Location," Geophys. Res. Lett., VOL. 34, L03818, doi:10.1029/2006GL028149, 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.

Xu, S., P. Jaffe, D.L. Mauzerall, "A Process-based Model for Methane Emission from Flooded Rice Paddy Systems," Ecological Modeling, vol. 205, pp. 475-491, 2007.

West, J.J., A. F. Fiore, L. W. Horowitz, D. L. Mauzerall, Mitigating Ozone Pollution with Methane Emission Controls: Global Health Benefits, Proceedings of the National Academy of Science, vol. 103, no. 11, March 14, 2006.

Wang, X. and D.L. Mauzerall, Evaluating Impacts of Air Pollution in China on Public Health: Implications for Future Air Pollution and Energy Policies, Atmospheric Environment, Volume 40, Issue 9, Pages 1706-1721, March 2006.

Tong, D.Q. and D.L. Mauzerall, Spatial Variability of Summertime Tropospheric Ozone over the Continental United States: Implications of an evaluation of the CMAQ model , Atmospheric Environment, 40, 3041-3056, 2006.

Tong, D. Q., N.Z. Muller, D.L. Mauzerall, R.O. Mendelsohn, "Integrated Assessment of the Spatial Variability of Ozone Impacts from Emissions of Nitrogen Oxides," Environmental Science and Technology, 40:5, 1395- 1400, 2006.

Tong, D.Q. and D.L. Mauzerall, Technical Note: Numerical instability in the Community Multi-scale Air Quality model and its impacts on aerosol and ozone simulations, Atmospheric Environment, submitted November 2005.

Mauzerall, D.L. and D.Q. Tong, Premature Mortalities Caused by U.S. Air Pollution, Science, to be submitted 2005.

Naik, V., D. L. Mauzerall, L.W. Horowitz, D. Schwarzkopf, V. Ramaswamy, and M. Oppenheimer, Net Radiative Forcing Due to Changes in Regional Emissions of Tropospheric Ozone Precursors, J. of Geophys. Res., vol. 110, D24306, doi:10.1029/2005JD005908, December 2005.

Wang, X, D.L. Mauzerall, Y. Hu, A.G. Russell, E.D. Larson, J-H. Woo, D.G. Streets, A. Guenther, A High- Resolution Emission Inventory for Eastern China in 2000 and Three Scenarios for 2020, Atmospheric Environment, Volume 39: No. 32, 5917-5933, October 2005.

Mauzerall, D.L., B. Sultan, N. Kim, D.F. Bradford, NOx Emissions: Variability in Ozone Production, Resulting Health Damages and Economic Costs, Atmospheric Environment, Volume 39: No. 16, pp. 2851-2866, May 2005.

Liu, J. and D.L. Mauzerall, Estimating the Average Time for Inter-continental Transport of Air Pollutants, Geophysical Research Letters, vol 32, doi:10.1029/2005GL022619, 2005.

Liu, J., D.L. Mauzerall, L.W. Horowitz, Analysis of Seasonal and Inter-annual Variability in Trans-Pacific Transport, Journal of Geophysical Research, 110, D04302, doi: 0.1 029/2004JD005207, 2005.
National Research Council/National Academies of Science, "Air Quality Management in the United States," (with

Wang, X. and D.L. Mauzerall , Characterizing distributions of surface ozone and its impact on grain production in China, Japan and south Korea: 1990 and 2020, Atmospheric Environment, Vol. 38, pp. 4383-4402, 2004.

Hale, T. and D.L. Mauzerall, Thinking Globally and Acting Locally: Can the Johannesburg Partnerships Coordinate Action on Sustainable Development?, Journal of Environment and Development, September 2004.

Horowitz, L.W., Walters, S., Mauzerall, D.L., Emmons, L.K., Rasch, P.J., Granier, C., Tie, X., Lamarque, J.F., Schultz, M.G., Tyndall, G.S., Orlando, J.J., Brasseur, G.P., A global simulation of tropospheric ozone and related tracers: Description and evaluation of MOZART, version 2, Journal of Geophysical Research, 108 (D24), 4784, doi:10.1029/2002JD002853, 2003.

Mauzerall, D.L . and Wang, X., Protecting Agricultural Crops from the Effects of Tropospheric Ozone Exposure: Reconciling Science and Standard Setting in the United States, Europe and Asia, Annual Review of Energy and Environment, 2001.

Contributing author to Climate Change: The Scientific Basis -- Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change, Chapter 4, Atmospheric Chemistry, Cambridge University Press, 2001.

Contributing author to Climate Change: Impacts, Adaptation, and Vulnerability -- Contribution of Working Group III to the Third Assessment Report of the Intergovernmental Panel on Climate Change, Chapter 9, Sector Costs and Co-benefits of Mitigation, Cambridge University Press, 2001.

Mauzerall, D.L ., D. Narita, H. Akimoto, L. Horowitz, S. Walters, D. Hauglustaine, G. Brasseur, Seasonal characteristics of tropospheric ozone production and mixing ratios over East Asia: A global three-dimensional chemical transport model analysis, Journal of Geophysical Research, 105, pp. 17895-17910, 2000.

Mauzerall, D.L ., J.A. Logan, D.J. Jacob, B.E. Anderson, A.S. Bachmeier, G.W. Sachse, D.R. Blake, J.D. Bradshaw, H. Fuelberg, B.G. Heikes. Photochemistry in Biomass Burning Plumes and Implications for Tropospheric Ozone over the Tropical South Atlantic, Journal of Geophysical Research, 103, pp. 8401-8423, 1998.

Mauzerall, D.L ., D.J. Jacob, S.-M. Fan, J.D. Bradshaw, G.L.Gregory, G.W. Sachse, D.R. Blake. Origin of Tropospheric Ozone at Remote High Northern Latitudes in Summer, Journal of Geophysical Research, 101, pp. 4175-4188, 1996.

Jacob, D.J., B.G. Heikes, S.-M. Fan, J.A. Logan, D.L. Mauzerall, J.D. Bradshaw, H.B. Singh, G.L. Gregory, R.W. Talbot, D.R. Blake, G.W. Sachse. Origin of Ozone and NOx in the Tropical Troposphere: a Photochemical Analysis of Aircraft Observations over the South Atlantic Basin, Journal of Geophysical Research, 101, pp. 24235-24250, 1996.

Fan, S.-M., D.J. Jacob, D.L. Mauzerall, J.D. Bradshaw, S.T. Sandholm, D.R. Blake, H.B. Singh, R.W. Talbot, G.L. Gregory, G.W. Sachse. Origin of Tropospheric NOx over Subarctic Eastern Canada in Summer, Journal of Geophysical Research, 99, pp. 16867-16877, 1994.

Mauzerall, D.L . Protecting the Ozone Layer: Phasing out Halon by 2000. Fire Journal. Sept./Oct. 1990.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Personnel Record

Date: December 2008

Name: John Matthew Reilly

Department: Sloan School

1. Date of Birth: August 26, 1955

2. Citizenship: US

3. Education:

School	Degree	Date
University of Wisconsin	BS	1976
University of Pennsylvania	MS	1979
University of Pennsylvania	PhD	1983

4. Title of Thesis for Most Advanced Degree:

An Economic Analysis of Global Energy and Carbon Dioxide Emissions

5. Principal Fields of Interest:

Energy, Agricultural and Environmental Economics, Integrated Assessment of Global Change

6. Non-MIT Experience (including military service):

Employer	Position	Beginning	Ending
US, Dep't of Energy Energy Info. Adm.	Economist	June 1978	August 1978
US Dep't of Transportation Office of the Secretary	Economist	June 1979	August 1979
Institute for Energy Analysis Oak Ridge Ass. Univ.	Research Scientist	January 1980	July 1985
Pacific Northwest National Laboratory Battelle Memorial Inst.	Research Scientist	July 1985	August 1986
US Dep't of Agriculture Econ. Res. Serv.	Dep. Dir. for Res.	August 1986	July 1998

7. History of MIT Appointments:

Rank	Beginning	Ending
Visiting Researcher (Intergov'l Per. Agr.)	July 1992	June 1993
Principal Research Scientist, Energy Laboratory	July 1998	Sept. 2003
Senior Research Scientist, Laboratory for Energy & the Environment	Sept. 2003	June 2007
Senior Lecturer, Sloan School	July 2007	present

8. Consulting Record:

Firm	Beginning	Ending
Stratus Consulting	August 1998	June 1999
University Corporation for Atmospheric Research (UCAR)	December 1998	June 2001
Asian Development Bank	January 2007	April 2007
Florida Legislature	October 2007	April 2008
Progressive Energy	December 2007	June 2008

9. Professional service:

Activity	Beginning	Ending
US delegate; OECD Ag. Research Director's Meeting	June 1988	June 1988
Author, Intergovnmt'l Pan. Climate Change (IPCC)	January 1989	June 1991
Chair, U.S. Fed. Task Group: Econ. of Global Change	June 1991	June 1992
Convening Lead Author, WG II, IPCC	March 1993	March 1996
National Acad. of Public Administration (reviewer)	June 1994	June 1994
Vice Chair, U.S. Nat. Assess. Working Group	May 1997	July 1998
NRC, Panel on Integrated Env. & Econ. Accounting	September 1997	August 1999
Co-Chair, US Ag. Sector Assessment of Climate Change	October 1998	January 2002
NRC, Committee on Global Change Research	July 2000	February 2002
Adv. Com. Consort. for Ag. Soils Mitigation of GHGs	September 2001	Sept. 2004
US Carbon Cycle Science Steering Group	May 2003	June 2006
US Climate Change Science Program, Lead Author, Synthesis and Assessment Product 2.1	January 2005	July 2007
EPRI California Climate Policy Project: Research Advisory Board	June 2006	January 2007
Massachusetts Blue Ribbon Panel		

10. Awards Received:

Award	Date
USDA Award for Superior Service	June, 1989
ERS Administrator's Award for Outstanding Research	April, 1989
ERS Excellence Award	November, 1995
Alan A. Powell Award	June, 2001

11. Current Organization Membership:

Organization	Offices Held
American Economic Association	
American Geophysical Union	

12. Biographical Sketch

Dr. Reilly is the Associate Director for Research in the Joint Program on the Science and Policy of Global Change and Senior Research Scientist in the Laboratory for Energy and the Environment at MIT. Much of his 20-year research career has focused on the economics of climate change, including modeling of energy use and carbon emissions and on the economic impacts of climate change on agriculture as well as consideration of agriculture and forestry sinks. He has published numerous articles, books, and reports on the economics of climate change and on other issues related to natural resources, technology, and energy use and supply. He was a principal author for the agricultural impacts chapter of the IPCC Second Assessment Report, co-chaired the agricultural sector assessment of the US National Assessment on Climate Variability and Change, and has served on many US Federal government and international committees. Prior to joining MIT in 1998, he spent 12 years with the Economic Research Service of USDA, most recently as the Acting Director and Deputy Director for Research of the Resource Economics Division. He has been a scientist with Battelle's Pacific Northwest National Laboratory and with the Institute for Energy Analysis, Oak Ridge Associated Universities. He received his Ph.D. in economics from the University of Pennsylvania in 1983 and holds a B.S. in economics and political science from the University of Wisconsin and is a member of the American Economics Association.

Publications of John M. Reilly

1. Books
    1. Edmonds, J., J. Reilly, Global Energy: Assessing the Future, Oxford University Press, 1985
    2. J. Reilly (editor), Agriculture: The Potential Consequences of Climate Variability and Change, Cambridge University Press, 2002.
2. Papers in Refereed Journals
    1. Edmonds, J. and J. Reilly, 1983. A long-term, global, energy-economic model of carbon dioxide release from fossil fuel use, *Energy Economics*, **5:** 74-87.
    2. Edmonds, J. and J. Reilly, 1983. Global energy production and use to the year 2050, *Energy*, **8:** 419-432.
    3. Edmonds, J. and J. Reilly, 1983. Global energy and co_2 to the year 2050, *The Energy Journal*, **4:** 21-47.
    4. Reilly, J. and J. Edmonds, 1985. Energy forecasting and CO_2 emissions in changing climate: a review, *The Energy Journal*, **6**: 137-154.
    5. Reilly, J., J. Edmonds, R. Gardner, and A. Brenkert, 1987. Monte carlo analysis of the IEA/ORAU energy/carbon emissions model, *The Energy Journal*. **8**: 1-29.
    6. Reilly, J.and S. Shankle, 1988. Auxiliary heating in the residential sector, *Energy Economics*, **8**: 29-42.
    7. Kane, S., J. Reilly, M. LeBlanc, and J. Hrubovcak, 1989. Ethanol's role, *AgriBusiness*, **summer**.
    8. Kane, S. and J. Reilly, 1989. Competitiveness of the US fuel ethanol industry, *Energy*, **14**: 259-275.
    9. Kane, S., J. Reilly, and J. Tobey, 1992. Economic effects of climate change on world agriculture, *Climatic Change*, **21:** 17-35.
    10. Tobey, J., J. Reilly, S. Kane, 1992, Economic Implications of global climate change for world agriculture, *Journal of Agricultural and Resource Economics*, **17**, 195-204.
    11. Reilly, J. and K. Richards, 1993. An economic interpretation of the trace gas index issue, *Environmental and Resource Economics*, **3:** 41-61.
    12. Reilly, J., N. Hohmann, and S. Kane, 1994. Climate change and agricultural trade, *Global Environmental Change*, **4:** 24-36.
    13. Reilly, J., 1995. Crops and climate change, *Nature* (News and Views), **367:** 118-119.
    14. Reilly, J. and K. Fuglie, 1998. Future yield growth in field crops, *Soil and Tillage Research*, **47**: 275-290.
    15. Reilly, J., 1999. What does climate change mean for agriculture in developing countries? *Research Observer*, **14**: 295-305.
    16. Reilly, J. and D. Schimmelpfennig, 1999. Agricultural impacts, vulnerability, and adaptation, *Climatic Change*, **43:** 745-788.
    17. Reilly, J., 1999. Climate change and agriculture: the state of scientific knowledge, *Climatic Change*, **43:** 650-659.
    18. Reilly, J., et al., 1999. Multigas assessment of the Kyoto Protocol, *Nature*, **401:** 549-555.
    19. Babiker, M, J. Reilly, A.D. Ellerman, 2000. Japanese nuclear power and the Kyoto agreement", *Journal of Japanese and International Economics*, **14:** 169-188.
    20. Reilly, J. and D. Schimmelpfennig, 2000. "Irreversibility, uncertainty, and learning: portraits of adaptation to long-term climate change, *Climatic Change*, **45:** 253-278.

21. Babiker, M., J. Reilly, H. Jacoby, 2000. The Kyoto Protocol and developing countries, *Energy Policy*, **28**: 525-536.

22. Reilly, J., P.H. Stone, C.E. Forest, M.D. Webster, H.D. Jacoby, and R.G. Prinn, 2001. Uncertainty and climate change assessments, *Science* **293**: 430-433.

23. Babiker, M.H., H.D. Jacoby, J.M. Reilly & D.M. Reiner, 2002. The evolution of a climate regime: Kyoto to Marrakech, *Environmental Science and Policy*, **2/3**: 195-206.

24. Webster, M.D., M. Babiker, M. Mayer, J. M. Reilly, J. Harnisch, R. Hyman, M. C. Sarofim, and C. Wang, 2002. Uncertainty in emissions projections for climate models, *Atmospheric Environment*, **36(22):** 3659-3670.

25. Reilly, J., M. Mayer, and J. Harnisch, 2002. Multiple gas control under the Kyoto agreement, *Environmental Modeling and Assessment*, 7: 217-229.

26. Reilly, J., 2002. Farming forecast: rainy and warm, *Forum for Applied Research and Public Policy*, **Summer**: 64-69.

27. Viguier, L., M. Babiker and J. Reilly, 2003. The costs of the Kyoto Protocol in the European Union, *Energy Policy,* **31**: 459-481.

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81. Reilly, J.M., & S. Paltsev , "European Greenhouse Gas Emissions Trading: A System in Transition." In: Economic Modelling of Climate Change and Energy Policies [C. De Miguel, X. Labandeira, & B. Manzano, eds.), Edward Elgar Press, Cheltenham, UK: 45-64, 2006.

82. Webster, M., S. Paltsev & J. Reilly, "The Value of Emissions Trading," MIT Joint Program for the Science and Policy of Global Change, Report No. 132, Feb.2006

83. Otto, V.M., A. Löschel & J. Reilly, "Directed Technical Change and Climate Policy," MIT Joint Program for the Science and Policy of Global Change, Report No. 134, April 2006.

84. Gurgel, A., G. Metcalf & J. Reilly, "Comparing Tax Rates Using OECD and GTAP6 Data," MIT Joint Program for the Science and Policy of Global Change, Technical Note No. 7, (May) 2006

85. Asadoorian, M., M. Sarofim, J. Reilly, S. Paltsev & C. Forest, "Historical Anthropogenic Emissions Inventories for Greenhouse Gases and Major Criteria Pollutants" MIT Joint Program for the Science and Policy of Global Change, Technical Note No. 8, (July) 2006.

86. Choumert, F., S. Paltsev & J. Reilly, "Improving the Refining Sector in EPPA"MIT Joint Program for the Science and Policy of Global Change, Technical Note No. 9, (July) 2006.

87. Asadoorian, M., J. Reilly & A. Masurkar, "Analyzing Methane-Emitting Activities: Longitudinal Data, Emissions Coefficients, and Spatial Distributions" Joint Program for the Science and Policy of Global Change, Technical Note No. 10, (July) 2006

88. Otto, M.V., & J. Reilly, "Directed Technical Change and the Adoption of CO_2 Abatement Technology: The Case of CO_2 Capture and Storage," MIT Joint Program for the Science and Policy of Global Change, Report No. 139,(August) 2006

89. Paltsev, S., J. Reilly, H. Jacoby, A. Gurgel, G. Metcalf, A. Sokolov & J. Holak, "Assessment of U.S. Cap-and-Trade Proposals," MIT Joint Program for the Science and Policy of Global Change, Report No. 146, April 2007

90. Reilly, J., & S. Paltsev, "Biomass Energy and Competition for Land," MIT Joint Program for the Science and Policy of Global Change, Report No. 145, (April 2007) and In: T. Hertel, S. Rose, R.Tol (eds.), *Economic Analysis of Land Use in Global Climate Change Policy*, Routledge Press Routledge, in press (expected January 2009; ISBN 978-0-415-77308-9 (forthcoming).

91. Reilly, J., S. Paltsev & F. Choumert, "Heavier Crude, Changing Demand for Petroleum Fuels, Regional Climate Policy, and the Location of Upgrading Capacity: A Preliminary Look," MIT Joint Program for the Science and Policy of Global Change, Report No. 144 (April 2007)

92. Gurgel, A., S. Paltsev, J. Reilly, G. Metcalf, "US GHG Cap-and-Trade Proposals: Application of a Forward-Looking Computable General Equilibrium Model." MIT Joint Program for the Science and Policy of Global Change, Report No. 147, April 2007

93. Clarke, L., J.Edmonds, H. Jacoby, H. Pitcher, J. Reilly, R. Richels, *CCSP Synthesis and Assessment Product 2.1, Part A: Scenarios of Greenhouse Gas Emissions and Atmospheric Concentrations*, U.S. Climate Change Science Program, Washington DC

94. Paltsev, S. and J. Reilly, Energy Scenarios for East Asia: 2005-2025, In: Shaping the Future Prospects for Asia's Long-term Development Over the Next Two Decades (F. Zhai, ed.), Asian Development Bank (in press) and MIT Joint Program for the Science and Policy of Global Change, Report (in press).

95. Prinn, R., J. Reilly, M. Sarofim, C. Wang, and B. Felzer, "Effects of Air Pollution Control on Climate: Results from an Integrated Assessment Model", Chapter 8 in: M.E. Schlesinger, H.S. Kheshgi, J. Smith, F.C. de la Chesnaye, J.M. Reilly, T. Wilson, and C. Kolstad (eds.), *Human-Induced Climate Change: An Interdisciplinary Assessment,* Cambridge University Press, Cambridge: 93-102, 2007.

96. Paltsev, S., J.M. Reilly, H.D. Jacoby, and K. H. Tay, "How (and Why) do Climate Policy Costs Differ Among Countries?" Chapter 24 in M.E. Schlesinger, H.S. Kheshgi, J. Smith, F.C. de la Chesnaye, J.M. Reilly, T. Wilson, and C. Kolstad (eds.), *Human-Induced Climate Change: An Interdisciplinary Assessment,* Cambridge University Press, Cambridge: 282-293, 2007.

97. Webster, M., S. Paltsev & J. Reilly, "The Value of Emissions Trading," Energy Policy, in review, 2007

98. Melillo, J, A. Gurgel, D. Kicklighter, J. Reilly, T. Cronin, B. Felzer, S. Paltsev, C. Schlosser, A. Sokolov and X. Wang, 2008. Unintended environmental consequences of a global biofuels program, MIT Joint Program for the Science and Policy of Global Change, Report 160, (in press)

99. Paltsev S., J. Reilly, A. Gurgel, 2008. Chapter 5: Greenhouse Gas Markets, Carbon Dioxide Credits, and Biofuels. In: The Biofuels Market: Current Situation and Alternative Scenarios (editor: S. Zarrilli), United Nations Conference on Trade and Development (UNCTAD), Geneva, Switzerland (in review)

100. Paltsev S., J. Reilly, A. Gurgel, 2008. Chapter 9: Commercial Viability of Second Generation Biofuels Technology. In: The Biofuels Market: Current Situation and Alternative Scenarios

(editor: S. Zarrilli), United Nations Conference on Trade and Development (UNCTAD), Geneva, Switzerland (in review).

101. Sandoval, R., V.J. Karplus, S. Paltsev and J. Reilly: 2008. Modeling the Prospects for Hydrogen Powered Transportation Through 2100, MIT Joint Program for the Science and Policy of Global Change, Report 154 (February). (J. of Transport Economics and Policy, in press)

102. Metcalf, G.E., S. Paltsev, J. M. Reilly, H.D. Jacoby & J. Holak, Analysis of U.S. Greenhouse Gas Tax Proposals, MIT Joint Program for the Science and Policy of Global Change, Report 160, (April 2008)

103. Babiker, M., A. Gurgel, S. Paltsev & J. Reilly, 2008. A Forward Looking Version of the MIT Emissions Prediction and Policy Analysis (EPPA) Model, MIT Joint Program for the Science and Policy of Global Change, Report 161, (May).

104. Wigley, T.M.L., L.E. Clarke, J.A. Edmonds, H.D. Jacoby, S. Paltsev, H. Pitcher, J. M. Reilly, R. Richels, M.C. Sarofim, S.J. Smith. Uncertainties in climate stabilization, Climatic Change (in review).

105. Jacoby, H.D., M.H. Babiker, S. Paltsev and J.M. Reilly: 2008. Sharing the Burden of GHG Reductions, MIT Joint Program for the Science and Policy of Global Change, Report 167, (November)

106. Prinn, R., S. Paltsev, A. Sokolov, M. Sarofim, J. Reilly and H. Jacoby: 2008. The Influence on Climate Change of Differing Scenarios for Future Development Analyzed Using the MIT Integrated Global System Model, MIT Joint Program for the Science and Policy of Global Change, Report 163, (September), and *Climatic Change* (in review)

107. Morris, J., S. Paltsev and J. Reilly: 2008. Marginal Abatement Costs and Marginal Welfare Costs for Greenhouse Gas Emissions Reductions: Results from the EPPA Model, MIT Joint Program for the Science and Policy of Global Change, Report 164 (November), and *Resource and Environmental Economics* (in review).

108. Webster, M., S. Paltsev, J. Parsons, J. Reilly and H. Jacoby: 2008. Uncertainty in Greenhouse Emissions and Costs of Atmospheric Stabilization, MIT Joint Program for the Science and Policy of Global Change, Report 165, (forthcoming)

109. Webster, M.D., and J.M. Reilly: 2008. Constructing probabilistically-based emissions scenarios, *Energy Economics*, in review

110. Babiker, M., A. Gurgel, S. Paltsev, J. Reilly: 2008. Forward Looking versus Recursive Dynamic Modeling in Climate Policy Analysis: A Comparison, *Economic Modeling*, in review.

5. Internal Memoranda and Progress Reports.

1. Reilly, J., "West Germany: Industrial Energy Demand in 1985 and 1990," ORAU/IEA, Contractor Report, August 1980

2. Mayer, M., M., R. Hyman, J. Harnisch, and J. Reilly, Emissions Inventories and Time Trends for Greenhouse Gases and other Pollutants, Technical Note No. 1, Joint Program on the Science and Policy of Global Change, July 2000: http://web.mit.edu/globalchange/www/abstracts.html#tn1

3. Reilly, J., M. Babiker, M. Webster and M. Sarofim, Probabilistic Emissions Scenarios, Technical Note No. 2, Joint Program on the Science and Policy of Global Change, July 2000: http://web.mit.edu/globalchange/www/technote2.html

4. Reilly, J.M., M.H. Babiker, R.S. Eckaus, H.D. Jacoby, R.G. Prinn, D.M. Reiner, E.B. Skolnikoff and M.D. Webster, "New Departures in Climate Change Policies: A U.S. and Global Strategy on Climate Change," Memorandum Prepared for the US Administration Officials, April, 2001.

5. Reilly, J., MIT EPPA Model Projections and the U.S. Administration's Proposal Technical Note No. 1, Joint Program on the Science and Policy of Global Change, March 2002): http://web.mit.edu/globalchange/www/abstracts.html#tn3

6. Reilly, J. (coordinator), The Economic and Climate Implications of a 750 versus a 550 ppm CO_2 Stabilization Goal, Memorandum Prepared for the US DOE and other US Administration Officials, Sept., 2002.

6. Invited Lectures, (Selected Recent Invited Lectures).

October, 1998, "Climate Change: Impacts on Agriculture," The Business Roundtable, Annapolis, MD

January, 1999, "The Economics and Policy of Carbon Sinks," MIT Global Change Forum XIV, Cambridge, MA

January, 1999, "Understanding the Impacts of Climate Change: Where Are We?" International Petroleum Industry Environment and Conservation Association, Boston, MA.

March, 1999, "Adaptation to Climate Change," Environmental Economics and Policy Seminar, Harvard University, Cambridge, MA.

March, 1999, "The Economics and Policy of Carbon Sinks," Workshop on Climate Change and the Kyoto Protocol, Fundacion Chile, Santiago, Chile,

June, 1999, "Welfare, GNP, and Terms of Trade Effects of the Kyoto Protocol: A Focus on the European Free Trade Area," Conference on CO_2 Emissions Trading, Oslo, Norway

June, 1999, "Economics of the Kyoto Protocol," Norwegian Ministry of Petroleum and Energy, Oslo, Norway.

July, 1999, "Economics of Climate Impacts: Comment On the Greening of Global Warming" Seminar on the Greening of Global Warming, American Enterprise Institute-Brookings Joint Center For Regulatory Studies, Washington DC.

July, 1999, "Multigas Assessment of the Kyoto Protocol," Energy Modeling Forum, Summer Workshop, Snowmass, Colorado.

July, 1999, "Irreversibility, Uncertainty, And Learning: Portraits Of Adaptation To Long-Term Climate Change," Energy Modeling Forum, Summer Workshop, Snowmass, Colorado.

September, 1999, "Multiple Gas Control Under the Kyoto Agreement," Second Annual Conference on Non-CO_2 Greenhouse Gas Emissions, The Netherlands.

February, 2000, "Trade Impacts of Carbon Policies: MIT EPPA Results," Energy Modeling Forum-18, Stanford University, Stanford, CA.

February, 2000, "Impacts of Climate Change on US Agriculture," American Association for the Advancement of Science, Annual Meeting, 20 February, 2000, Washington DC, also, Agriculture and Global Climate Change Meeting, Farm Bureau, Washington DC, April, 2000, and also, Congressional Staff Briefing organized by the Population Resource Center, Washington DC, April, 2000.

March, 2000, "Non-Annex B Impacts of Annex B Policies," Framework Convention on Climate Change (FCCC) Subsidiary Body for Scientific and Technical Advice (SUBSTA) Workshop on Article 4.8 and 4.9 of the Convention, Bonn, Germany.

April, 2000, "Endogenizing GHG Control in A CGE Model," Environmental Protection Agency, Washington DC, also, Snowmass Summer Workshop, Snowmass CO, August, 2001.

April, 2000, "Uncertainty in Emissions Projections for Climate Models," Environmental Protection Agency, Washington DC, also Snowmass Summer Workshop, Snowmass, CO. August, 2001.

May, 2000, "Integrated Earth Systems Modeling and the Economics of the Kyoto Protocol, American Geophysical Union Spring Meeting, Washington DC.

October, 2000, "Alternative Scenarios of Climate Change," American Association of Energy Economists Workshop on Climate Scenarios, Washington DC.

November, 2000, "Climate Change Impacts on Agriculture in the United States," American Nuclear Society International Meeting, Washington DC.

January, 2001, "Climate Policy After COP-6," MIT Global Change Forum XVII, New Delhi, India.

March, 2001, "Abrupt Climate Change and Agriculture," National Research Council and Yale/NBER Program on International Environmental Economics, Workshop on Economic and Ecological Impacts of Abrupt Climate Change, Washington D.C.

May, 2001, "The MIT Emissions Prediction and Policy Analysis (EPPA) Model," The 3rd Sino-Korea-U.S. Economic and Environmental Modeling Workshop, Beijing, China.

June, 2001, "Climate Change Policy: Now What?," Fourth Annual Conference on Global Analysis, Purdue University, West Lafayette, Indiana.

August, 2001, "Do Resources Matter?" Pew Center Workshop on Oil and Gas Markets, Snowmass CO.

October, 2001, "Techology Strategies for Climate Change: Some Thoughts," MIT Global Change Forum XVIII, Cambridge, MA.

October, 2001, "Anatomy of a $2 Deal (Were we off by $369?) and What Next?" Agriculture and Forestry Sequestration Workshop, Shepherdstown, West Virginia.

October, 2001, "The Price Of Action, The Cost Of Inaction: The Intersection Of Science And Economics," Bt Lectures Series: The Science, Economics And Policy Of Sustainable Strategies, MIT Architecture Department, Cambridge, MA.

November, 2001, "The Permanence of Atmospheric Carbon Reduction Options," MIT Carbon Sequestration Forum, Royal Sonesta Hotel, Cambridge, MA .

December, 2001, "The MIT IGSM: Climate Change, Urban Air Pollution and Long Range Transport," Workshop on Climate Change and Air Quality: Part I - Intercontinental Transport and Climatic Effects of Pollutants, Research Triangle, North Carolina.

January 2002, "The MIT Emissions Prediction and Policy Analysis (EPPA) Model & Non-CO_2 GHGs," Non-CO2 GHG Network Meeting, Maastricht, Netherlands.

January, 2002, "Implications of a GDP-Indexed Global Emissions Target," US Environmental Protection Agency, Washington DC, also US Council of Economic Advisors, Washington DC, January, 2002.

March 2002, "The MIT Emissions Prediction and Policy Analysis (EPPA) Model & Transportation," Conference On GHG Emissions Trading and the Transportation Sector, Governor's House, Washington DC.

May, 2002, "Atmospheric Stabilization: What Does It Mean in a Multi-gas World," Energy Modeling Forum (EMF 21), University of Maryland, College Park, MD.

June, 2002, "Is International Permit Trading Always Beneficial," MIT Global Change Forum XIX, Paris, France.

January, 2003, "Emissions Trading," MIT Global Change Forum XX: Sponsor's Meeting, La Jolla, California

February, 2003, "Multigas Contributors to Global Climate Change," PEW Center on Global Climate Change, Arlington, VA.

April, 2003, "Climate Change and the Economics of the Carbon Cycle," Ohio State University, OARDC Annual Conference, Columbus, Ohio

May, 2003, "Complexities In International Trade of Greenhouse Gas Emissions Permits—An International Architecture Without Trading, Duke University, Conference on Climate Policy Beyond Kyoto, Raleigh-Durham, North Carolina, also June, 2003, Resources for the Future, Washington DC.

July, 2003, "Economics and Health Effects," US EPA Workshop for Health Scenarios Development: Strategies for the Future, Washington DC, also EMF Summer Climate Change Impacts and Integrated Assessment Workshop, Snowmass, CO.

July, 2003, "Ecosystems in the MIT IGSM: Climate and Tropospheric Ozone Interactions," EMF Summer Climate Change Impacts and Integrated Assessment Workshop, Snowmass, CO.

February, 2004, "PPP and MER: Perspectives of a GTAP-based CGE Modeler, Purchasing Power Parity vs Market Exchange Rates Workshop, February 19-20, Stanford University

June, 2004, "Agriculture, Ecosystems & Pollution Policy: Is There a Link to Climate?" XXII MIT Global Change Forum & 6th FEEM Climate Policy Workshop, June 8-11, Venice Italy.

August, 2004, "Climate Impacts of Air Pollution Policy," Climate Change Impacts and Integrated Asssessment Workshop, Aug. 1-6, Snowmass, CO

August, 2004, "How (and Why) Do the Costs of Climate Policy Differ Among Countries," Climate Change Impacts and Integrated Assessment Workshop, Aug. 1-6, Snowmass, CO

September, 2004, The MIT Integrated Global System Model, Applications to Economics and Policy, 1st Atlantic Workshop on Energy and Environmental Economics: Economic Modelling Of Climate Change Policies, A Toxa, Spain, 9-12 Sept. 9-12

September, 2004, "Climate Change, Tropospheric Ozone, and Carbon Policy," EPRI Global Climate Change Area Council, Boston, Sept. 28-29

October, 2004, "Issues in Forestry and Agriculture Greenhouse Gas Emissions Modeling," Forestry and Agriculture Greenhouse Gas Modeling Forum, Shepherdstown, West Virginia, Oct. 12-15.

October, 2004, "Emissions Trading and Transportation," International Petroleum Industry Environment and Conservation Association, Baltimore, Maryland, Oct. 12-13.

October, 2004, "Agriculture, Ecosystems & Pollution Policy: An Integrated Look," Final TranSust Conference: Modelling the Transition to Sustainable Economic Structure, Organized by The Fondazione Eni Enrico Mattei (FEEM) and The Austrian Institute of Economic Research (WIFO, Venice, Italy, Oct. 28-29

November, 2004, "Possible Next Steps for Climate Policy," Climate Policy Post 2012, European Commission Director General, Research, Technology, and Development, Brussels, Belgium Nov, 9

November, 2004, "Challenges To Incorporating Black Carbon and Organic Carbon in Integrated Assessment Models," Energy Modeling Forum 22: Climate Policy Scenarios for Stabilization and in Transition, Brussels, Belgium, Nov.10-12.

November, 2004, "Possible Next Steps for Climate Policy in a Multigas World," Energy Modeling Forum 22: Climate Policy Scenarios for Stabilization and in Transition, Brussels, Belgium, Nov.10-12.

December 2004, "The Economic Impact of Climate, CO_2, and Tropospheric Ozone on Crop Yields in China, the US, and Europe," Poster presentation, American Geophysical Union Fall Meeting, San Francisco, California.

February 2005, "Managing the Carbon Cycle: Interactions between the Economy and Biosphere," BIOCAP Canada Foundation, First National Conference, Ottawa, Canada.

March 2005, "Economic Effects of Environmental Change on Agriculture," Colloquium on Interfaces between Climate and Economic Dynamics, Interlaken, Switzerland.

March 2005, "Issues in Managing Carbon Land Use Sinks and Sources," Third USDA Symposium on Greenhouse Gases & Carbon Sequestration in Agriculture and Forestry, Baltimore, Md. (March 24-25).

May 2005, "Approach and Progress on Integrating Land-Use Change in the MIT IGSM," EMF 22 Working Group Meeting, Stanford University, Stanford, CA (May 25 – 27)

May 2005, Member of US Delegation, G8 Energy Research and Innovation Workshop, Oxford UK (May 11-12)

June 2005, "Adding Humans to Earth Systems Models: A Progress Report" International Postdoctoral Scientist Network for Earth System Science, Breckenridge, Colorado (June 24)

July 2005, "Managing the Carbon Cycle: Interactions between the Economy and Biosphere," 2005 Annual Meeting Northeastern Branch, American Society of Agronomy and Soil Science Society of America, Nathan Hale Inn, University of Connecticut, Storrs, Connecticut (July10-13).

July 2005, "Methods for Modeling Environmental Impacts in EPPA Computable General Equilibrium Model", Snowmass Summer Workshop in Climate Change Impacts and Integrated Assessment, Snowmass CO (July 25- Aug. 4)

September 2005, Author Meeting of the US Climate Change Science Program Product 2.1, New Scenarios Development, US Climate Change Science Program/Department of Energy, Washington DC (Sept. 8)

September 2005, "Renewable Energy and Efficiency: Their Role in Meeting Future Energy Needs in Light of the Threat of Climate Change," Science, Technology and Society Forum 2005, Kyoto, Japan (Sept. 11-13)

September 2005, "Technology Needs and Climate Change," Symposium on Boosting Science and Technology through Industrial Collaboration, Sponsored by the Japan External Trade Organization, Tokyo, Japan (Sept. 14)

September 2005, "Human-Biosphere Interactions," Earth-Atmosphere Interactions: Understanding and Responding to Multiple Environmental Stresses, National Academy of Science, Board on Atmospheric Sciences, Irvine, CA (Sept. 29-30)

March 2006, "Macroeconomic Modeling Approaches: General Equilibrium Analysis of GHG and R&D Policy Interactions," Workshop to Explore European and U.S. Perspectives on the Economics of Climate Change, Resources for the Future, Washington DC, (Mar. 2-3)

April 2006, The Value of International Emissions Trading In CO_2 Allowances, Iowa State University, Economics Department Seminar Series (April 12).

April 2006, Climate Change Earth Day Discussion, WEBCAST, Washington, DC (April 21).

April 2006, Oil Markets—Transition or Continuing Evolution, A DOE/EPA Workshop on the Economic and Environmental Implications of Global Energy Transitions, Resources for the Future, Washington DC, (April 20-21).

June 2006, Global Energy and Environment: Solving the Technology Challenge to Meet World Demands. MIT Symposium on Energy Research, Cambridge, MA (June 15)

June 2006, Cap-&-Trade Proposals: Proposed Analysis, Briefing for US Senate Staff, Sponsored by the Environmental and Public Works Committee, Washington DC (June 27)

January 2007, Scenarios of Greenhouse Gas Emissions and Atmospheric Concentrations, Briefing for the Deputy Secretary for Science, US DOE (January 15)

January 2007, Scenarios of Greenhouse Gas Emissions and Atmospheric Concentrations, Briefing for Executive Office of the President, (January 15)

January 2007, Preliminary Analysis of US Congressional Proposals to Limit Greenhouse Gas Emissions, Briefing for Staff of Senators Lieberman and McCain, (January 2005).

February 2007, Discounting and Damages in the Stern Review, IAP Session, MIT (February 1)

March 2007, Recent Developments in US Climate Policy, and some analysis, 5th Climate Policy Network Meeting, Centre for European Economic Research (ZEW), Mannheim, Germany (March 8-9)

April 2007, Coal Gasification and Carbon Capture:. Economics, Coal Gasification 2007: Pre-Conference on Carbon Capture, Transport, and Building Carbon Value, Denver CO (April 11)

April 2007, "Revisiting the Role of a Backstop Technology in a General Equilibrium Model" Economics Department, University of Wyoming (April 16)

December, 2007, "Florida's Cellulosic Biofuel Production Potential and Value for Greenhouse Gas Abatement," Florida Legislature Environment & NaturalResources Council and the Committee on Energy,December 12, 2007

December, 2007, "Potential contribution of second generation biofuel technology and possible environmental consequences," Fall 2007 CEEPR Workshop, Royal Sonesta, Cambridge, MA, December 6-7, 2007

November, 2007, "Emissions Prediction and Policy Analysis Model: The Science, Frameworks, Methods, and Computation Behind the Tools," Federal Energy Regulatory Commission Briefing, 20 November 2007

November, 2007, "From Evidence for an Anthropogenic Contribution to Climate Change to Projections of Future Change, Potential Impacts, Adaptation and Mitigation," Florida Legislature's Symposium on the Science and Economics of Climate Change, November 6 , 2007, Tallahassee, Florida

September, 2007, "Macroeconomic Effects of Climate Change," International Monetary Fund Workshop, Climate Change: Economic Implications and Policy Responses September 20, 2007, HQ1 Building, Washington, D.C.

September, 2007, "Integrated Assessment Modeling: The MIT IGSM Approach," International Monetary Fund Workshop, Climate Change: Economic Implications and Policy ResponsesSeptember 20, 2007, HQ1 Building, Washington, D.C.

September, 2007, "Incorporating Land Use, Bioenergy, and Climate Feedbacks: An Application of the GTAP land data," Sept 14, 2007, Global Trade Analysis Project, Purdue University

July, 2007, "Incorporating Impacts and Adaptation into an Integrated Assessment Model: The MIT IGSM Approach," EMF Climate Change Impacts and Integrated Assessment Summer Workshop, July 25, 2007, Snowmass, CO, USA

August, 2007, "Stern Report—Damages and Discounting," 2007 MIT-Energy Initiative Endicott House Symposium on Climate Change, Endicott House, Dedham, MA, August 8-9, 2007

June, 2007, "The Scale and Timing of the Mitigation Effort," MIT Global Change Forum XXVI Coping with Climate Change, June 20-22, 2007, Cambridge, MA

May, 2007, "An Economic Perspective on GWPs," EPRI 2007 Global Climate Seminar, May 30- 31, 2007, Washington, DC

June, 2007, "Potential Demand for Biofuels," GTAP Tenth Annual Conference on Global Economic Analysis, "Assessing the Foundations of Global Economic Analysis", West Lafayette, IN, USA, June 7-9, 2007

July, 2007, "Incorporating Impacts and Adaptation into an Integrated Assessment Model: The MIT IGSM Approach," presentation to the EMF Climate Change Impacts and Integrated Assessment Summer Workshop, Snowmass, Colorado, July 25, 2007.

August, 2007, "Stern Report—Damages and Discounting," presentation to the 2007 MIT Energy Initiative Endicott House Symposium on Climate Change, Dedham, Massachusetts, August 8-9, 2007.

September, 2007, "Incorporating Land Use, Bioenergy, and Climate Feedbacks: An Application of the GTAP land data," presentation to the Global Trade Analysis Project, Purdue University, September 14, 2007.

September, 2007, "Macroeconomic Effects of Climate Change," and "Integrated Assessment Modeling: The MIT IGSM Approach," presentations to the International Monetary Fund Workshop, Climate Change: Economic Implications and Policy Responses, Washington, D.C., September 20, 2007.

November, 2007, "From Evidence for an Anthropogenic Contribution to Climate Change to Projections of Future Change, Potential Impacts, Adaptation and Mitigation," presentation to the Florida Legislature's Symposium on the Science and Economics of Climate Change, Tallahassee, Florida, November 6 , 2007.

November, 2007, Briefing to the Federal Energy Regulatory Commission on "Emissions Prediction and Policy Analysis Model: The Science, Frameworks, Methods, and Computation Behind the Tools," Washington, DC, 20 November 2007.

December, 2007, "Potential contribution of second generation biofuel technology and possible environmental consequences," Fall 2007 CEEPR Workshop, Cambridge, MA, December 6-7, 2007.

"Florida's Cellulosic Biofuel Production Potential and Value for Greenhouse Gas Abatement," presentation to the Florida Legislature Environment & Natural Resources Council and the Committee on Energy, Tallahassee, Florida, December 12, 2000.

January 2008, Panelist in session on "The past is prelude: A conversation with IPCC authors," at the Alliance for Global Sustainability Annual Meeting, MIT, Cambridge, MA, 28 January 2008.

March, 2008, "Potential contribution of second generation biofuel technology and possible environmental consequences," MIT Global Change Forum XXVII Challenges to Low-CO2 Energy Supply at Proposed Scale and Pace Arlington, VA, March 26-28, 2008

June 2008, "Lessons from economic modeling of climate change cap-and-trade," BIPARTISAN STAFF BRIEFING Hosted by the Committee on Energy and Commerce, June 4, 2008, Room 2322 Rayburn House Office Building

May 2008, "Economics of Climate Change" Climate Change session, International Petroleum Industry Environemental and Conservation Association (IPIECA) AGM, 14 May 2008, Rio de Janeiro, Brazil Windsor Barra Hotel, Av. Sernambetiba 2630, Barra da Tijuca

May 2008, "Economic and Energy Market Effects of S. 2191: MIT Analysis and Comparison with other Analyses", Electric Power Research Institute, Workshop on Understanding Cost Estimates of Climate Policy, Washington DC May 8, 2008

April 2008, "Biofuels & Land Use at Intersection of Mitigation, Impacts, Adaptation, Presentation for a National Renewable Energy Laboratory (NREL) planning meeting. MIT April 22, 2008

April 2008, "The Role of Trade in the Analysis of Climate Impacts and Adaptation" *OECD Workshop on Economic Aspects of Adaptation,* OECD Headquarters, 2 Rue André Pascal 75016 Paris, April 7-8 2008

June 2008, "Economic Modeling of Climate Policy Costs", Invited Briefing for US House Staff Organized by the House Energy and Commerce Committee, June 4.

June 2008, "Economics of Biofuels and Land Use Change" Environmental and Societal Costs, Benefits and Ethics of Biofuels and Food, Princeton University, Princeton NJ, June 19-20

September 2008, "Post Kyoto Frameworks: Dreams, Promises & Idealized Architecture Meet the Numbers" ExxonMobil — Toyota Climate Discussions, Irving Texas, September 8-10.

September 2008, "Biofuels—Possible Role, Land Use Implications, Policy" ExxonMobil — Toyota Climate Discussions, Irving Texas, September 8-10.

October 2008, "Tools for Analyzing GHG Mitigation Policy Costs—The EPPA CGE Framework" Assessing Economic Impacts of Greenhouse Gas Mitigation, Sponsored by the National Academies, Washington DC, October 2-3.

October 2008, "Biofuels and Land Use Change" Transition to a Bio Economy Environmental and Rural Development Impacts, Sponsored by USDA and the Farm Foundation, St Louis, MO, October 15-16,

October 2008, "Near Term Climate Policy: US and Others" MIT Global Change Forum, Cambridge MA, October 29-31.

November 2008, "Near Term Climate Policy: US, EU, Others" MIT Energy Initiative, First Annual Meeting, MIT, Cambridge, MA, November 14

November 2008, "Land Use and Carbon Implications of a Global Biofuels Industry in a CGE Model" Invited Lecture, Chalmers University, Goteburg, Sweden, November 24.

December 2008, "Canada's Bitumen Industry Under Post 2012 Global CO_2 Constraints" The Center for International Governance Innovation, Laurier Business and Economics, Waterloo Ontario, December 3-4.

Theses Supervised by John M. Reilly

Summary

	Total	Completed	In Progress
Master's	11	10	3
Doctoral			
As Supervisor	0	0	0
As Reader	4	1	3

Master's Theses

Hyman, Robert, "A More Cost-Effective Strategy for Reducing Greenhouse Gas Emissions: Modeling the Impact of Methane Abatement Opportunities," May 2001

Curtil, Laurianne, "Urban Air Pollution and Climate Policy, June 2002.

Xu, Yugao, "Participation of Developing Countries in a Global Climate Regime," June 2002.

Valpergue De Masin, Ardoin, "Air Pollution Abatement Costs," February 2003.

Yang, Trent, "Economic Implications of Urban Air Pollution In the United States: 1970-2000," February 2004.

Tay, Kok Hou, "Welfare Distortions of Climate Change Policies," May 2004.

Matus, Kira, "Health Impacts from Urban Air Pollution in China: The Burden to the Economy and the Benefits of Policy," May 2005.

Wang, Dulles, "The Economic Impact of Global Climate and Tropospheric Ozone on World Agricultural Production," May 2005.

See, Wee Chiang (Kelvin), "Carbon Permit Prices in the European Emissions Trading System: A Stochastic Analysis," May 2005.

Sandoval, Raynaldo, "Quantitative Analysis of Alternative Transportation under Environmental Constraints," Master of Science Thesis, MIT Technology and Policy Program, May 2006

Osouf, Nicholas, "The Potential for a Nuclear Renaissance: The Development of Nuclear Power Under Climate Change Mitigation Policies," Master of Science in Technology and Policy and Master of Science in Nuclear Science and Engineering, MIT June 2007

Anderson, Justin, "CO_2 Mitigation Costs for Canada and the Alberta Oil Sands," Master of Science in Aeronautics and Astronautics, MIT, January 2008

Doctoral Theses, Supervisor

Doctoral Theses, Reader

Shoemaker, Robbin, "The Incentive Effects of Agricultural Support Programs: A Dynamic Analysis of United States Agricultural Policy," George Washington University, Department of Economics, May 1992.

Current Students: Kung- Min Nam (Ph.D. Department of Urban Studies and Planning); Jaemin Song (Ph.D. Energy Systems Department); (M.S., Energy Systems Department), Valerie Karplus (M.S., Energy Systems Department), Jennifer Holak (M.S. Energy Systems Department, entering Fall 2007).

Valerie Thomas, PhD – Brief Biography

http://www2.isye.gatech.edu/people/faculty/Valerie_Thomas/

Valerie Thomas is the Anderson Interface Associate Professor in the School of Industrial and Systems Engineering at Georgia Tech, with a joint appointment in the School of Public Policy, and an adjunct appointment in the School of Earth and Atmospheric Sciences. Her research is in Industrial Ecology, with emphasis on the environmental impacts of materials and products. Current research includes environmental impacts of biofuels, the potential for renewable energy in Georgia, sustainability in Atlanta, environmental implications of second-hand markets, use of barcodes, RFID, and electronics for lifecycle tracking of products and wastes, and energy efficiency in freight transportation. Past research includes development of a research agenda for reinventing the use of materials, one of the eight Grand Challenges of Environmental Science identifed by the US National Research Council.

Thomas has a Ph.D. in theoretical physics from Cornell University and a B.A. in physics from Swarthmore College. She is a Member of the US EPA Science Advisory Board, a Member of the Panel on Public Affairs of the American Physical Society, and was Chair of the 2006 Gordon Research Conference on Industrial Ecology, which was held at Queens College, Oxford UK, from August 6-11, 2006.

In 2004-2005 she was the American Physical Society Congressional Science Fellow, during which time she worked in the legislative office of Representative Rush Holt on science policy issues including energy policy legislation and legislation to re-establish a technology assessment capacity in the U.S. Congress. She also managed the Congressional R&D Caucus and the Congressional Biomedical Research Caucus for Rep. Holt.

From 1989 to 2004, Thomas was a Research Scientist and Lecturer at Princeton University. From 1987 to 1999 she was a Research Fellow in the Department of Engineering and Public Policy at Carnegie Mellon University.

Selected Publications

"The Environmental Potential of Reuse," V. M. Thomas. Submitted to Journal of Industrial Ecology, February 2007.

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"Emissions and Exposure to Metals: Cadmium and Lead," V. Thomas and T. Spiro.

"The Industrial Ecology Agenda," C. Andrews, F. Berkhout and V. Thomas.

"Soil as a Vulnerable Environmental System," J. Schnoor and V. Thomas.

"Industrial Ecology in the Manufacturing of Consumer Products," W. France and V. Thomas.