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EDUCATION

- 2004 Ph.D., Atmospheric Sciences
Georgia Institute of Technology, Atlanta, GA
Thesis: "Photochemical formation and cost-efficient abatement of ozone: High-order sensitivity analysis"
Minor: Transportation Policy and Economics
- 1998 B.A., Applied Mathematics
Harvard University, Cambridge, MA

EMPLOYMENT

- 2006 – Assistant Professor of Environmental Engineering, Rice University
- 2004 – 2006 Environmental Specialist III, Georgia Environmental Protection Division
- 1999 – 2004 Graduate Research Assistant, Georgia Institute of Technology
- 1998 – 1999 Fulbright Scholar to Australia, CRC - Southern Hemisphere Meteorology
- 1997 – 1997 Research Intern, Northeast States for Coordinated Air Use Management
- 1995 – 1998 Teaching Fellow and Research Assistant, Harvard University

SPONSORED RESEARCH

Grants funded as Principal Investigator:

- "CAREER: Ground-truthing Ozone and Particulate Matter Sensitivities to Emissions Trends." National Science Foundation. 7/2009 – 6/2014. \$497,770.
- "Incorporating Uncertainty Analysis into Integrated Air Quality Planning." U.S. Environmental Protection Agency STAR Grant. Co-Investigators: D. Cox, M. Bell, J. Boylan, A. Marmur, M. Bergin. 10/2007 – 10/2009. \$299,770.
- "Integrated Economic, Environmental, and Reliability Modeling of Power System Growth." Shell Center for Sustainability. Co-Investigators: L. Duenas-Osorio, P. Hartley, and K. Medlock. 1/2008 – 1/2009. \$32,000.
- "Sustainable Production and Deployment of Biodiesel in Texas." Shell Center for Sustainability. Co-Investigators: K. Zygorakis and R. Gonzalez. \$50,600.
- "A Roadmap to Clean Air and Sustainable Energy in Texas." Texas Business for Clean Air. Co-Investigator: Birnur Buzcu-Guven. 6/2008 – 8/2008. \$41,494.
- "Exploratory Study of Power Systems Options in Texas." Rice University Energy and Environmental Systems Institute. 7/2007 – 8/2008. \$5,000.

Grants funded as Co-P.I.:

Camille and Henry Dreyfus Foundation, funding to support Dreyfus Postdoctoral Fellow in Environmental Chemistry. P.I.: R. Griffin. 1/2010 – 12/2011. \$120,000.

Subawards:

“Clean Air Benefits Estimation Project.” Houston Endowment. 8/2008 – 1/2009.
(Subcontract from University of Texas School of Public Health, \$65,000).

“Air Quality Modeling of TexAQS-II Episode with Data Assimilation.” Texas Environmental Research Consortium. 4/2008 – 8/2009. (Subcontract from University of Houston, \$33,700).

“Incorporation of High-Order Decoupled Direct Method (HDDM) Sensitivity Analysis into CAMx.” Texas Commission on Environmental Quality. 6/2007 – 8/2007.
(Subcontract from ENVIRON International Corp., \$18,878).

“A Seasonal Perspective on Regional Air Quality in Central California.” U.S. Department of Energy. 7/2006 – 6/2007. (Subcontract from Lawrence Berkeley National Laboratory, \$25,000).

“Regional Transport Modeling for East Texas.” Houston Advanced Research Center. 1/2006 – 6/2006. (Subcontract from University of Houston, \$3,500).

PEER-REVIEWED PUBLICATIONS**Submitted Papers:**

Cohan, D.S., B. Koo, and G. Yarwood. Influence of uncertain reaction rates on ozone sensitivity to emissions in Houston. Submitted to *Atmospheric Environment*, 2009.

Digar, A., and D.S. Cohan. Efficient characterization of pollutant-emission response under parametric uncertainty. Submitted to *Environmental Science & Technology*, 2009.

Tian, D., M.S. Bergin, D.S. Cohan, S. Napelenok, Y. Hu, M. Chang, A.G. Russell. Uncertainty analysis of ozone formation and response to emission controls using high-order sensitivities. Submitted to *Journal of the Air & Waste Management Association*, 2009.

Published Papers:

Kim, S., D.W. Byun, and D. Cohan (2009). Contributions of inter- and intra-state emissions to ozone over Dallas-Fort Worth, Texas. *Civil Engineering and Environmental Systems*, 26, 103-116.

Jin, L., S. Tonse, D.S. Cohan, X. Mao, R.A. Harley, and N.J. Brown (2008). Direct sensitivity analysis of ozone formation in California's San Joaquin Valley. *Environmental Science & Technology*, 42, 3683-3689.

- Bergin, M.S., A.G. Russell, M.T. Odman, D.S. Cohan, and W.L. Chameides (2008). Single-source impact analysis using 3D air quality models. *Journal of the Air & Waste Management Association*, 58, 1351-1359.
- Napelenok, S.L., D.S. Cohan, M.T. Odman, and S. Tonse (2008). Extension and evaluation of sensitivity analysis capabilities in a photochemical model. *Environmental Modelling & Software*, 23, 994-999.
- Cohan, D.S., J.W. Boylan, A. Marmur, and M.N. Khan (2007). An integrated framework for multi-pollutant air quality management and its application in Georgia. *Environmental Management*, 40, 545-554.
- Cohan, D.S., D. Tian, Y. Hu, and A.G. Russell (2006). Control strategy optimization for attainment and exposure mitigation: Case study for ozone in Macon, Georgia. *Environmental Management*, 38, 451-462.
- Cohan, D.S., Y. Hu, and A.G. Russell (2006). Dependence of ozone sensitivity analysis on grid resolution. *Atmospheric Environment*, 40, 126-135.
- Chestnut, L.G., D.S. Cohan, and D.M. Mills (2006). Cost-benefit analysis in the selection of efficient multipollutant strategies. *Journal of the Air & Waste Management Association*, 56, 530-536.
- Greenwald, R., M.H. Bergin, J. Xu, D. Cohan, G. Hoogenboom, and W.L. Chameides (2006). The influence of aerosols on crop production: A study using the CERES crop model. *Agricultural Systems*, 89, 390-413.
- Napelenok, S.L., D.S. Cohan, Y. Hu, and A.G. Russell (2006). Decoupled direct 3D sensitivity analysis for particulate matter. *Atmospheric Environment*, 40, 6112-6121.
- Cohan, D.S., A. Hakami, Y. Hu, and A.G. Russell (2005). Nonlinear response of ozone to emissions: Source apportionment and sensitivity analysis. *Environmental Science & Technology*, 39, 6739-6748.
- Cohan, D.S., G.A. Sturrock, A.P. Biazar, and P.J. Fraser (2003). Atmospheric methyl iodide at Cape Grim, Tasmania, from AGAGE observations. *Journal of Atmospheric Chemistry*, 44, 131-150.
- Cohan, D.S., J. Xu, R. Greenwald, M.H. Bergin, and W.L. Chameides (2002). Impact of atmospheric aerosol light scattering and absorption on C-uptake by terrestrial plants. *Global Biogeochemical Cycles*, 10.1029/2001GB001441.
- Cohan, D.S., M.G. Shultz, D.J. Jacob, B.G. Heikes, D.R. Blake (1999). Convective injection and photochemical decay of peroxides in the tropical upper troposphere: Methyl iodide as a tracer of marine convection. *Journal of Geophysical Research*, 104, 5717-5724.

BOOK CHAPTERS

- Cohan, D., A. Russell (2007). Cost-optimized air pollution control using high-order sensitivity analysis. *Air Pollution Modeling and Its Application XVII*, Eds. C. Borrego and A.-L. Norman, Springer Publishing, pp. 48-58.
- Cohan, D., Y. Hu, A. Russell (2007). Alternative approaches to diagnosing ozone production regime. *Air Pollution Modeling and Its Application XVII*, Eds. C. Borrego and A.-L. Norman, Springer Publishing, pp. 140-148.

REPORTS

- Cohan, D., B. Buzcu-Guven, D. Hodges-Copple, D. Bullock, and R. Tomlin (2009). Policy Options for Clean Air and Sustainable Energy in Texas. Prepared for Texas Business for Clean Air.
- Koo, B., G. Yarwood, and D. Cohan (2007). Incorporation of High-order Decoupled Direct Method (HDDM) Sensitivity Analysis Capability into CAMx. Prepared for Texas Commission on Environmental Quality.
- Cohan, D. (2004). Programmer's guide to the Decoupled Direct Method for the Community Multi-scale Air Quality Model.
- Chang, M. et al. (2004). Fall-line Air Quality Study Final Report: An analysis of air quality and options for managing it in middle Georgia. Report to Georgia Dept. of Natural Resources.
- Cohan, D., D. Tian, Y. Hu, A. Russell (2004). Cost-effectiveness assessment of ozone abatement options in the Fall-line regions of Georgia. Report to Georgia DNR.
- Hu, Y., D. Cohan, M. Odman, A. Russell (2004). Air quality modeling of the August 11-20, 2000 episode for the Fall-Line Air Quality Study. Report to Georgia DNR.

SCIENTIFIC PRESENTATIONS

Invited:

- "Uncertainty in Integrated Air Quality Planning." Georgia Air Policy Symposium, Atlanta, GA, 2009.
- "Reaction rate uncertainty in the development of control strategies." International Conference on Atmospheric Chemical Mechanisms, Davis, CA, 2008.
- "Air quality modeling to inform health impact analyses." University of Texas School of Public Health departmental seminar, Houston, TX, 2008.
- "Photochemical sensitivity analysis and its application to policy." University of Houston Department of Civil & Environmental Engineering, Houston, TX, 2008.
- "High-order sensitivity analysis of photochemical models." Nankai University College of Environmental Science and Engineering, Tianjin, China, 2008.
- "Electric power generation and air quality." Carnegie Mellon University Electricity Center, Pittsburgh, PA, 2008.
- "Photochemical sensitivity analysis and its application to policy." Texas A&M Department of Atmospheric Sciences seminar, College Station, TX, 2007.

- "High order sensitivity analysis in an air quality model: Methods and applications." Air & Waste Management Association North Carolina Chapter, RTP, NC, 2006.
- "An integrated approach to air quality management." Canadian Council of Ministers of the Environment Strategic Planning Workshop: Future Directions for Air Management, Toronto, Canada, 2005.
- "Modeling the air quality impacts and health benefits of emissions reductions." EPA Air Innovations Conference, Chicago, IL, 2005.
- "Decoupled direct method for atmospheric sensitivity analysis." EPA Regulatory Modeling Workshop, New Orleans, LA, 2005.
- "CMAQ-DDM: Method, performance, and application." University of Houston Department of Geosciences seminar, Houston, TX, 2005.

Other:

- "Accuracy of multi-parameter response surfaces generated from sensitivity coefficients." CMAS Conference, Chapel Hill, NC, 2009.
- "Photochemical modeling to inform environmental policy." Dissertations Initiative for the Advancement of Climate Change Research, Hilo, HI, 2007.
- "High order sensitivity analysis to inform control strategy development." A&WMA Specialty Conference on Integrated Control Strategies, Durham, NC, 2006.
- "Integrating atmospheric science into air quality planning: Challenges and opportunities." American Meteorological Society Annual Meeting, Atlanta, GA, 2006.
- "Air quality modeling for control strategy development." NOAA/EPA Golden Jubilee Symposium, Durham, NC, 2005.
- "Atmospheric modeling for abatement strategy formulation." Gordon Research Conference on Atmospheric Chemistry, Big Sky, MT, 2005.
- "Atmospheric science in the public realm." Atmospheric Chemistry Colloquium for Emerging Senior Scientists, Yellowstone National Park, WY, 2005.
- "An integrated approach to air quality attainment." American Association of Aerosol Research International Specialty Conference, Atlanta, GA, 2005.
- "Heterogeneity of ozone yield with location of NO_x emission origin." American Geophysical Union Fall Conference, San Francisco, CA, 2004.
- "Applicability of CMAQ-DDM to source apportionment and control strategy development." Models-3 Users Workshop, Durham, NC, 2004.
- "Impact of atmospheric particulate matter on plants." Southeast Ecology & Evolution Conference, Atlanta, GA, 2004.
- "Sensitivity analysis of ozone in the Southeast." Models-3 Users Workshop, Durham, NC, 2003.
- "Implementation of a direct sensitivity analysis method into CMAQ." Models-3 Users Workshop, Durham, NC, 2002.
- "Impact of aerosol light attenuation on plant growth." American Geophysical Union Fall Conference, San Francisco, CA, 2000.

“Emission of methyl iodide from the Southern Ocean.” International Conference on Southern Hemisphere Meteorology and Oceanography, Santiago, Chile, 2000.

“Low ozone episodes over southern Australia in summer 1999.” American Geophysical Union Fall Conference, San Francisco, CA, 1999.

“Methyl iodide at Cape Grim, Tasmania.” SOAPEX II post-campaign meeting, Melbourne, Australia, 1999.

“Methyl iodide as a tracer of marine convection.” Cape Grim Annual Scientific Meeting, Melbourne, Australia, 1998.

HONORS AND AWARDS

Monetary Awards:

National Science Foundation CAREER Award (2009-2014)

Outstanding Faculty Associate Award, Will Rice College (2007)

National Science Foundation Graduate Research Fellow (1999-2002)

Georgia Tech Presidential Scholar (1999-2003)

Georgia Air & Waste Management Association Scholarship (2003)

Best Scientific Publication Award, Georgia Tech Earth & Atmospheric Sciences (2003)

Best Speaker, Georgia Tech EAS Graduate Student Symposium (2003)

American Meteorological Society Paul H. Kutschenreuter Scholar (1998)

Coca-Cola Scholar (1994-1998)

Non-monetary Honors:

Distinguished Associate Award, Will Rice College (2009)

Doughtie Outstanding Associate Award, Will Rice College (2008)

Community Modeling & Analysis System Award of Appreciation (2004)

Chronicle of Higher Education Rising Star Nominee (2004)

Phi Beta Kappa (1998)

Invited Colloquia:

Dissertations Initiative for the Advancement of Climate Change Research (2007)

Atmospheric Chemistry Colloquium for Emerging Senior Scientists (2005)

American Meteorological Society Summer Policy Colloquium (2003)

PROFESSIONAL AND COMMUNITY INVOLVEMENT

Professional Memberships:

American Geophysical Union

American Meteorological Society

Air & Waste Management Association

American Society for Engineering Education

Association of Environmental Engineering and Science Professors

Professional Service:

Georgia Air Policy Symposium: Founding chair

Faculty Associate and Divisional Advisor: Will Rice College
CMAQ Model Review Committee
Session Chair: A&WMA Specialty Conference on Integrated Control Strategies (2006)
Session Co-Chair: American Meteorological Society Annual Meeting (2010)

Peer Reviewer:

Journals: Atmospheric Environment; Environmental Management; Environmental Science & Technology; Geophysical Research Letters; Journal of Applied Meteorology; Journal of Environmental Management; Journal of Geophysical Research
Grants: National Science Foundation

COURSES TAUGHT

CEVE/ESCI/ENST 307, "Energy and the Environment" (Spring 2007-2010)
CEVE 411/511, "Atmospheric Processes" (Fall 2008-2009)
CEVE 611, "Advanced Topics in Air Pollution" (Fall 2007-2008)

STUDENTS ADVISED

Graduate Students: Wei Zhou, Ph.D. Student, 2007-
Antara Digar, Ph.D. Student, 2007-
Wei Tang, Ph.D. Student, 2008-

Post-doctoral Fellow: Dr. Xue Xiao, 2008-

Undergraduate Research: Raleigh Ricart, Carlos Rojo, Kirti Datla, Kyle Saari, Daniel Hodges-Copple, Oviea Akpotaire, Seoyeon Hong, Andrew Pegues, Catherine Douglass, Willie Xu

Thesis Committees: Shagun Bhat, Ph.D., 2007
Andrea Zimmer, M.S., 2007
Vinitha Chinnakani, M.S., 2007
Hilary Robinson, M.S., 2009
Yuling Jia, Ph.D., 2009
Wei Tang, M.S., 2009