

Linda A. George
Portland State University
Environmental Sciences and Management
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Professional Preparation:

Loyola University of Chicago, Chemistry, B.S. *cum laude*, 1983
Portland State University, Environmental Sciences & Resources/Chemistry, Ph. D., 1991
Dissertation Title: "Development of a direct, low pressure, laser-induced fluorescence measurement technique for NO₂, ambient measurements and urban NO_x chemistry"
Dissertation Director: Robert J. O'Brien

Appointments:

Associate Editor (Atmosphere Section), *Science of the Total Environment*, Elsevier Ltd., 2007 -
Associate Professor, Environmental Sciences and Management, Portland State University, 2007-
Associate Professor, CSE & Environmental Sciences, Portland State University, 2005 - 2007
Associate Professor, Center for Science Education, Portland State University, 2002-2005
Assistant Professor, Center for Science Education, Portland State University, Portland OR, 1996-2002
Assistant Professor, Chemistry Department, Portland State University, Portland OR, 1994-1996
Senior Scientist and Co-Owner, Wy'East Environmental Sciences, Inc., 1992-1994 (left to pursue academic career)
Adjunct Professor of Physical Chemistry, Linfield College, McMinnville, OR, 1991-1992
Graduate Research Assistant, Portland State University, 1985-1991
High School Physics Teacher, United States Peace Corps - Togo, West Africa, 1983-1984

Research interests:

Atmospheric chemistry, monitoring and modeling of urban air pollutants, assessing human exposure to and perception of air quality and climate change using statistical models and GIS, development of measurement techniques for quantifying atmospheric species, investigations of urban climate modification and atmospheric science education

Scholarly Products:

Papers:

- J. Parra and L. George, "Atmospheric Pressure Laser-Induced Fluorescence Determination of Ambient Levels of NO₂", accepted, *Applied Optics*, 2009
- L. George and J. Brenner, "Increasing Scientific Literacy about Global Climate Change through a Laboratory-based Feminist Science Course", accepted, *Journal of College Science Teaching*, 2009.
- Vivek Shandas and Linda George, "Neighborhood, Neighborhood, Neighborhood: Spatial Patterns of Air Toxins and Implications for Metroscopic Residents and Urban Planners", *Metroscopic*, Winter 2009.
- D. Meka, L. George, S. Prasad, "Polymer Nanocomposite Based Electrical Nitrogen Dioxide Gas Sensor", *Journal of the Association of Laboratory Automation*, No. 4, 69-75, 2009.
- Semenza, J.C., Hall D., Wilson D., Bontempo, B., Sailor, D. and George, L.A., "Public Perception of Climate Change: Voluntary Mitigation and Barriers to Behavior Change", *American Journal of Preventive Medicine*, 35(5), 479-487, 2008.

- G. Duh, V. Shandas, H. Chang and L. George, "Rates of Urbanization and the Resiliency of Air and Water Quality", *Science of the Total Environment*, 400, (1-3), 238-256, 2008.
- J. Semenza, D. Wilson, J. Parra, B. Bontempo, D. Sailor and L. George, "Public perception and behaviour change in relationship to weather and air pollution", 107(3):401-11, *Environmental Research*, 2008.
- M. Mavko and L. George, "Sub-Neighborhood Scale Geographic Regression Model for Predicting Nitrogen Dioxide Levels", *Science of the Total Environment* 398, 68-75, 2008.
- L.A. George and W. Becker, "Investigating the Urban Heat Island Effect", *Journal of Geoscience Education*, 51(2) 237-243 2003.
- T.M. Hard, L.A. George and R.J. O'Brien, "An Absolute Calibration for Gas-Phase Hydroxyl Measurements", *Environmental Science and Technology*, 36(8) 1783-1790, 2002.
- L.A. George, T.M. Hard and R.J. O'Brien, "Measurements of Free Radicals OH and HO₂ in Los Angeles Smog," *Journal of Geophysical Research-Atmospheres*, 104, 11643-11656, 1999.
- C. Swihart, D. Atkinson, L.A. George, "Assessing the impact of biogenic emissions from an urban forest on urban air quality with field measurements and computer modeling", Invited Paper, Research Corporation Partners in Science Conference Summary. 1999.
- L.A. George and J. Straton, "Integrating Science into a Multidisciplinary Course as a Means to Develop Critical Thinking," *Journal of General Education*, Vol. 28, 111-117, No. 2, 1999.
- T.M. Hard, L.A. George and R.J. O'Brien, "FAGE Determination of Tropospheric HO and HO₂", *Journal of Atmospheric Sciences*, 52, pp. 3354-3372, 1995.
- M..J. Campbell, B.D. Hall, J.C. Sheppard, P.L. Utley, R.J. O'Brien, T.M. Hard and L.A. George, "Intercomparison of Local Hydroxyl Measurement by Radiocarbon FAGE Techniques", *Journal of Atmospheric Sciences*, 52, pp. 3421-3427, 1995.
- R.J. O'Brien and L.A. George, "Tropospheric Chemical Reactivity and Its Consequences for Clean and Polluted Air " in *The Science of Global Change*, published by the American Chemical Society, editors D. Dunnette and R.J. O'Brien, pp. 64-118, 1992.
- L.A. George and R.J. O'Brien, "Prototype FAGE Determination of NO₂", *Journal of Atmospheric Chemistry*, 12, 195-209, 1991.
- C.Y. Chan, T.M. Hard, A. Mehrabzadeh, L.A. George and R.J. O'Brien, "Third Generation FAGE Instrument for Tropospheric Hydroxyl Radical Measurement", *J. Geophysical Res.*, 95, 18569, 1990.

Conference Proceedings (peer-reviewed):

- Polymer Nanocomposite-based chemiresistive NO₂ gas sensor, Divakara Meka, Linda George, Shalini Prasad, *NSTI-Nanotech*, Vol 2, 2008.
- Health Effects of Long-Term Exposure to Typical Urban Center Ozone Levels, J. Parra, L. George, *Proceedings of Annual Air and Waste Management Meeting*, Paper #615, 2008.
- A Sensitive and Selective Chemiresistive Nanocomposite Device for Ambient NO₂ Detection, D. Meka, L. George, S. Prasad, *Proceedings of Annual Air and Waste Management Meeting*, Paper #602, 2008.

Online/Electronic/Other:

- George, L.A., Parra, J. and Sitbon, P., 2005. Horizons - Portland Area Real-Time and Archived Air Quality and Meteorological Data. Data access via Portland State University Server Website (<http://www.horizons.pdx.edu>). Portland State University, Portland, OR.
- VIM: Ventilation Index Model, novel near-realtime automated integration of multi-threaded web-accessible atmospheric data that is parsed, pre and post processed to create ventilation indices for air quality assessment purposes, completed March 2001, reviewed under contract by Air Advice, Inc.

Intellectual Property:

Provisional Patent: Polymer Nanocomposite Based Electrical Nitrogen Dioxide Gas Sensor, L. George, S.Prasad, D. Meka, May 2008.

Manuscripts in preparation:

L. George and V. Shandas, "Rapid assessment of emissions from urban freeway networks", to be submitted 2009

Funded or Pending Projects:

As PI or coPI

- pending NSF - "Fate of Nitrogen Oxides in a 130 km Flow Tube", submitted April, 2009 \$670K.
- pending - NSF-Opportunities and Barriers to Municipal Policy Innovation: The climate planning challenge, submitted Feb 2009 \$297K
- pending- NSF - PIRE: Coupled Human Natural Systems and Challenges to Water Resource Management in Rapidly Urbanizing Regions of the Indian Subcontinent -submitted Feb 2009 \$2,491,447.
- pending - OTREC/Miller Foundation: Building Capacity to Measure and Model the Environmental and Public Health Impacts of Traffic Flows and Traffic Management Policies in Urban Areas, submitted March 2009 \$100K
- PSU Faculty Enhancement, Assessing the Potential for Biological Mitigation Strategies of Mobile Sources of Air Toxins, with V. Shandas and T. Rosenstiel, 2008-9, \$9.5K.
- San Francisco Department of Public Health, "San Francisco NO_x Spatial Analysis Project", \$4.8K May 1-Dec 1 2008.
- National Science Foundation, "U.S.-India Joint Workshop: Coupled Human-Natural Systems and the Challenge of Rapid Urbanization to the Resiliency of Water Systems", \$50K, V. Shandas, G.Duh, H. Chang, L. George, Sept 2008 - August 2009.
- PSU Internationalization Grant, Infusing an international air quality improvement demonstration project with PSU best practices in community-based research, learning and policy development- collaboration between PSU and Chiang Mai, Thailand, L. George and S. Farquhar, 12/05-7/06, \$1200.
- Oregon Economic and Community Development Commission and USAID, "Air quality Demonstration Projects in two SE Asian Cities", 10/05-12/06, Total Project Budget: \$100,000
- Murdock Charitable Trust, "Spatial Analysis of Urban NO₂ Concentrations," , L. George and K. Childress, 7/05- 8/06, \$14,000
- National Science Foundation, "BE:CNH: Complex Interactions Among Urban Climate, Air Quality and Adaptive-Reactive Human Response", D. Sailor, J. Semenza, L. George, H.Taha , B. Bornstein, 9/1/04 -2/28/10, \$1,700,000
- McNair Scholars Program, a summer research program promoting graduate education for underrepresented undergraduate students, Summer 2004.
- Environmental Protection Agency, "Neighborhood Level Diesel Exhaust Component Monitoring near Freeway", D. Atkinson and L.A. George, 9/03-9/05, \$55k.
- Air Advice Inc, " Air Advice Particulate Sensor Performance Improvement Project - Phase I and II ", 1/03-4/03, L. George, \$10,000.
- Air Advice Inc., " Portland Airshed Monitoring and Modeling", L.A. George, 7/00-3/23/01, \$75K.

- National Science Foundation, “The Portland Horizons Project: Integrating Science Education and Scientific Research”, L.A. George, W. Becker and D. Johnson, 3/15/98-3/14/02, \$450K.
- Environmental Protection Agency, “A Robust HO₂ and RO₂ Radical Analyzer”, T.M.Hard, R.J.O’Brien, L.A. George, 12/97-12/99, \$350K.
- Environmental Protection Agency, “Atmospheric Free-Radical Measurements Related to Photochemical Oxidants”, T.M. Hard, R.J. O’Brien and L.A. George, 10/95-9/97, \$273K.
- American Association of Colleges and Universities, “Women and Scientific Literacy”, J. Brenner and L. George, 3/1/97-2/28/99, \$24K.
- PSU Faculty Development Grant, “Horizons Project Demonstration Site”, \$3.5K, 1997.
- Research Corporation/Murdock Charitable Trust, “Assessing the impact of biogenic emissions from an urban forest on urban air quality with field measurements and computer modeling”, L. George and C. Swihart, 9/96- 9/98,\$14K
- Tektronix Corporation Equipment Grant-in-Kind, \$20K, 1996.
- PSU Faculty Development Grant, "Urban Ozone and Free Radicals: An Improved Field Calibration Method", \$8.5K, 1994.
- Served as a Research Mentor for the Saturday Academy (\$2000/summer Grant-in-support), a summer research program for gifted high school juniors interested in science and engineering, PSU, 1994 and 1995.

As Project Consultant

- “Healthy Futures Collaborative”, Stephanie Farquhar PSU PI, Project Budget: \$10K, Role: Conduct indoor air quality assessments, 2007
- “Portland Environmental Justice Project”, Kevin O’Dell PI, Northwest Health Foundation, Project Budget: \$55K, Role: Analyze air quality data related to freeways, 2008
- “Assessment of Air Quality Impact for Potential Site for James Beard Portland Market”, Ron Paul Consulting, 2008

Presentations:

- “Exploring the Nexus Between Transportation Engineering, the Environment and Urban Planning”, PSU Civic Engagement Breakfast Series, April 2009.
- “Public perception and behavior change in relationship to hot weather and air pollution” Jan C. Semenza, Daniel J. Wilson Wilson, Jeremy Parra, Brian D. Bontempo, Melissa Hart, David J. Sailor, and Linda A. George, American Public Health Association Meeting, San Diego, CA, October 2008
- “Impact of Roadways Emissions on Air Quality”, Guest Seminar - Road Ecology Course, May 2008
- “Health Effects of Long-Term Exposure to Typical Urban Center Ozone Levels”, J. Parra and L. George, Annual Air and Waste Management Association Meeting, Portland OR, June 2008
- “A Sensitive and Selective Chemiresistive Nanocomposite Device for Ambient NO₂ Detection”, D. Meka, L. George, S. Prasad, Annual Air and Waste Management Association Meeting, Portland OR, June 2008
- “Urban Vegetation Patterns and Neighborhood-scale Air Quality”, V. Shandas and L. George, Urban Ecology and Research Consortium, Portland OR, February 2008
- “Polymer nanocomposite based chemiresistive gas sensors”, D. Meka, L. George, S. Prasad, LabAutomation Conference, Palm Springs CA, January 2008

- “Designing Summer Research Experiences for Teachers and Students That Promote Classroom Science Inquiry Projects and Produce Research Results”, L. A. George, J. Parra, M. Rao and L. Offerman, American Geophysical Union Fall Meeting, Dec. 2007.
- "Assessing neighborhood scale urban air quality using GIS modeling approaches", PSU Geography Colloquium, Oct 2007
- "Urban Air Pollution: A Challenging Common Resource Problem", L. George, St. John's Community Meeting, March 2007
- "Polymer nanocomposite based chemiresistive gas sensors", B. Sehkar, L. George and S. Prasad, Material Research Society, San Francisco, April 2007
- "Urban Air quality: Health and Economic Impact" , Invited Seminar, CEETIA, Hanoi Vietnam, October 2006
- "Urban Air Quality Management: Best Practices", Invited Seminar for Municipal Government of Chiang Mai, Thailand, October, 2006
- “A multi-faceted approach to assessing human response to extreme heat, poor air quality, and public advisories”, Hart, M., B. Bontempo, L. George, D. Sailor, and J. Semenza (2006) presented at the 6th International Conference on the Urban Climate (ICUC6) in Göteborg, Sweden, June.
- " A multi-faceted approach to assessing human responses to extreme heat, poor air quality and public advisories", M.Hart, B. Bontempo, L. George, D. Sailor and J. Semenza, International Conference on Urban Climate, June 2006.
- "Neighborhood Levels Impacts of I-5 Diesel Emissions", Region X Air Toxics Summit, Portland OR, Dean Atkinson and Linda George, Oct. 2005
- Workshops on Air Quality Monitoring with the Council of State Governments and US-AEP for environmental professionals in Chiang Mai, Thailand and Hanoi, Vietnam, Oct 2005.
- "Bridging Social Capital: Creating Context for Capstone Students", PSU Capstone Conference, June 2005
- " Science as a Social Justice Enterprise", Environmental Justice - Action Community Topics Conference, Vancouver, Washington, March 2005
- "Modeling the Complex Interactions Among Urban Climate, Air Quality and Adaptive/Reactive Human Response", Sailor D., Bornstein R., George L., Semenza J. and Taha, H, American Meteorological Society Meeting, January 2005.
- "Transforming Existing Science Curricula to Promote Science Inquiry", National Science Teachers Association Meeting, Portland, Oregon, Nov. 2002.
- “Relieving Traffic Congestion: Air Quality and Environmental Justice Implications”, Annual Conference of the Society of Environmental Journalists, Oct 2001.
- "Free Radical Analysis from FAGE", R.J. O'Brien, T.M.Hard, L.A. George, SCOS97-NARSTO Conference, February 2001.
- "Engaging Middle School and High School Teachers to Teach Atmospheric Science Through Scientific Research with the Horizons Project", L.A. George and P. Edwards, American Geophysical Union, Washington D.C., June 2nd, 2000.
- "Horizons Project and Atmospheric Inquiry", L.A. George and P. Edwards, Care for Air Workshop, Vancouver WA, May 1999.
- "Inquiry Science for All Students", with W. Becker and J. Smith, Council for Undergraduate Research - April Dialogue, Washington, D.C., April 1999.
- " Environmental Justice: Issues and Perspectives", Speaker/Moderator, Environmental Justice Panel, Lewis and Clark Law School, April 1999.

- " Teaching Scientific Inquiry through Research", P. Edwards, W. Becker and L. George, Oregon Academy of Sciences, Willamette University, February 1999.
- " Through the Eye of a Needle: What Does a Measurement Mean?," AACU Women and Scientific Literacy Conference, Providence RI, May 1998.
- "Ozone Formation in the Portland Metro Region", PSU Geography Colloquium, November 1997.
- " Gender and Scientific Literacy" with M. Halka and B. Chadwick, Lily Conference on Teaching, Portland OR, October 1997.
- "Community-Based Science Education in General Education," AACU "Two-Ways Streets: Women and Scientific Literacy" Conference, Phoenix, AZ, March 1997.
- " Scientific Literacy in University Studies", with J. Brenner, B. Chadwick, M. Flower, M. Halka and J. Straton, Portland State University, September 1997.
- "Atmospheric Free Radical Measurements Related to Photochemical Oxidants in Urban Air", R.J. O'Brien, L.A. George and T.M. Hard, American Geophysical Union Meeting, San Francisco, CA, December 1994.
- "Development of FAGE-NO₂, Urban NO_x Chemistry", Atmospheric Chemistry Colloquium for Emerging Senior Scientists, MIT 1991.

Courses Taught:

Existing Courses

- Natural Science Inquiry *
- General Chemistry
- Electronics for Scientists and Engineers

New Course Development

- Freshman Inquiry: Values in Conflict (3 term sequence, team taught and developed)
 - Fall - Education and Empowerment, Winter - Knowledge and Uncertainty, and Spring - The Politics of Art and the Art of Politics
- Atmospheric Interactions : Urban Air Quality *
- Experimentation: Texts and Test Tubes
- Science, Gender and Social Context *
- Horizons Air Quality Summer Research Institute (1 month intensive - 8 Grad. Credits)
- FUSE Summer Research Institute (1 month intensive - 8 grad credits) *
- Research-Based Learning I (graduate course) *
- Electronic Instrumentation and Data Collection for Science Teachers (on-line graduate course) *
- Diversity and Equity Issues in Science Education (graduate course) *
- Air Quality (graduate course) *
- Capstone: Air Quality and Environmental Justice *

*taught during 2002-2008

Graduate Advising:

Masters : Advisor (17)- Patrick Edwards '00 , Tasha Murray '02 , Margaret Johnson '03 , Charlotte Marshall '04, Karen Hunter '04, Tia Henderson '04, David Krassner '05, Mallory Pratt, Laura Offerman '07, Kate Norton '08, Matt Mavko '06 (ESR), Chris Bailey (ESR) '04; Sue Bartlett (ESR), Vinh Mason (ESR) '08, Justin Olexy (ESR), Bhuvan Sekhar (ECE) (w S. Prasad) '08, Christine Kendrick (ESR) Committee (3) - Kiren Bahm '01(PHYS), David Kuhn '05 (GEOG), Lacey Sullivan '05 (ESR)

Doctoral: Advisor (2)- Jeremy Parra (PHYS), Meena Rao (ESR) Committee (10) - Suman Cherian (CHEM) '98, Jennifer Spillman '02 (CHEM), Hossein Bazargan '05 (CHEM), Andreas Rechsteiner '05 (SYST), Edward

Chikwana '06 (CHEM), Yuki Monteith '08 (ED), James Radney (CHEM), Kayode Morakinyo (CHEM), Monica Wright (CHEM), Mike Ellison (ESR)

Media:

Interview for Portland Observer on Columbia River Crossing - front page article "Freeway Shudders", May, 2009

Interview for Alabama Public Radio - "Air quality improvements in US cities", with Barbara Bernstein, June 2008

Interview for KOIN TV - "Freeways and air pollution", aired Oct 31, 2007

Interview on Oregon Public Radio about new EPA ozone rule with Rob Manning, aired June 21, 2007

"Housing, cars don't mix: Land-use policies put more people near freeways — and in a danger zone", front page article by Jim Redden, Portland Tribune, April 20, 2007 - article based on in-depth interview of freeway air toxics research

"Difficult trade-offs ahead for land-use planners", Editorial, The Times, April 27, 2007 - editorial based on freeway air toxics research

Live interview on KBOO-Portland about freeway air toxics research, More Talk Radio Show, May 14, 2007

"Student's take a sharp look at area's weather, air", The Oregonian, January 4, 2001 -based on air quality teacher enhancement project Horizons.

Other:

- Board of Directors - Oregon Center for Environmental Health - 2005 -
- Scientific Advisory Committee - Air Advice, Inc. - 2005 -
- PSU President's Commission for Women - 2005 - 2007
- EPA Northwest Collaborative Air Priorities Project Leadership Team - 2002 to 2004
- NSF Review Panels (6) for Education, Geosciences and Human-Environment Programs 2003-2008
- EPA Review Panels (3) for STAR, STAR Fellowship and SBIR Programs 2000-2009
- Board of Directors - Portland Environmental Justice Action Group 2000-2005
- Mentor for Apprentices for Science and Engineering High School Students (10)
- Chair/Co-Chair - Stewards of the Environment Student Conference Planning Committee - 2000,2001
- PSU Women's Studies Program Advisory Board - 2001-2003
- Oregon Department of Environmental Quality Air Toxics Advisory Committee - Sept 2001 – May 2002
- PSU Faculty Senate 2000-2002, 2003-2005, 2008-
- PSU Faculty Senate Steering Committee 2008-
- PSU Academics Requirements Committee 2009-
- PSU College of Liberal Arts Curriculum Committee 2008-

Awards and Honors:

- PSU John Eliot Allen Outstanding Teaching Award - 2006
- PSU Teaching and Learning with Technology Faculty Award - 2000
- Selected as Portland State University's Project Kaleidoscope Faculty for the 21st Century - 1998
- Fellowship to the Atmospheric Chemistry Colloquium for Emerging Senior Scientists (ACCESS I) sponsored by NSF,NASA and DOE, 1991.
- Elected to Sigma Xi, 1990.
- National Science Foundation Atmospheric Sciences Summer Fellowship - 1986.

Professional Affiliations:

American Geophysical Union - Atmospheric Sciences Section

Air and Waste Management Association

National Science Teachers Association