

Michael Breen, Research Physical Scientist, in EPA's National Exposure Research Laboratory

Computational Exposure Division

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Area of Expertise: Dr. Breen's current research focuses on the development of air pollution exposure models, integrated with novel personal sensor technologies, to improve exposure and risk assessments for individuals in health studies and citizen scientists. He is a co-investigator for multiple health studies assessing the exposure and effects of air pollutants. These health studies include participants with asthma, diabetes, and coronary artery disease living in various U.S. cities. He has developed, evaluated, and applied novel exposure modeling and time-activity tools, which includes the Exposure Model for Individuals (EMI) and GPS-based Microenvironment Tracker (MicroTrac) model.

Select Publications:

Breen MS, Long T, Schultz B, Williams R, Richmond-Bryant J, Breen M, Langstaff J, Devlin R, Schneider A, Burke J, Batterman S, Meng Q. Air Pollution Exposure Model for Individuals (EMI) in Health Studies: Evaluation for Ambient PM_{2.5} in Central North Carolina. *Environ Sci Technol*. 2015 doi: 10.1021/acs.est.5b02765.

Breen MS, Burke J, Batterman S, Vette A, Norris G, Godwin C, Landis M, Croghan C, Schultz B, Long T Modeling Spatial and Temporal Variability of Residential Air Exchange Rates for the Near-Road Exposures and Effects of Urban Air Pollutants Study (NEXUS). *Int J Environ Res Public Health* 2014 11:11481-11504.

Breen MS, Long T, Schultz B, Crooks J, Breen M, Langstaff J, Isaacs K, Tan C, Williams R, Cao Y, Geller A, Devlin R, Batterman S, Buckley T. GPS-based Microenvironment Tracker (MicroTrac) Model to Estimate Time-Location of Individuals for Air Pollution Exposure Assessments: Model Evaluation in Central North Carolina. *J Expo Sci Environ Epidemiol*. 2014 24:412-420.

Breen M.S., Schultz B., Sohn M., Long T., Langstaff J., Williams R., Isaacs K., Meng Q., Stallings C., Smith L. A Review of Air Exchange Rate Models for Air Pollution Exposure Assessments. *J Expo Sci Environ Epidemiol*. 2013 doi:10.1038/jes.2013.30.

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Education:

- Ph.D., Biomedical Engineering, Case Western Reserve University, 2004

- M.S, Electrical Engineering, Rensselaer Polytechnic Institute, 1994
- B.S., Electrical Engineering, University of Massachusetts – Lowell, 1990

Professional Experience:

- Research Physical Scientist, USEPA, ORD, NERL, 2007-present
- Federal Post-Doctoral Fellow, USEPA, ORD, National Center for Computational Toxicology, 2005-2007
- Post-Doctoral Fellow/Research Associate, Case Western Reserve University, Department of Biomedical Engineering, 2004-2005
- Senior Research Engineer, Picker International (currently Phillips Medical Systems), Computed Tomography Research Division, 1997-1999
- Research Engineer, Research and Development/Missile Systems Laboratories, Raytheon Corporation, 1990-1997