

Robert Willis, Research Physicist, in EPA's National Exposure Research Laboratory

Exposure Methods and Measurements Division

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Area of Expertise: Robert's research focuses on applications of electron microscopy to environmental forensics. He manages the NERL Scanning Electron Microscopy (SEM) Laboratory. Robert develops SEM-based passive aerosol samplers and computer-controlled SEM techniques and conducts field studies to identify and understand pollution sources. His research interests include air quality monitoring, characterization of particulate matter, source apportionment, linking PM to human health effects, aerosols and climate change, and nanomaterials.

Select Publications:

Sawvel, E.J.; Willis, R.; Peters, T.M.; Kumar, N.; West, R.R.; Casuccio, G.; Hammond, D.; Norris, G.A. Passive sampling to capture the spatial variability of coarse particles by composition in Cleveland, OH. *Atmos. Environment*. 105:61 (2015).

Gantt, B., Hoque, S., Willis, R. D., Fahey, K. M., Delgado-Saborit, J. M., Harrison, R., Erdakos, G.B., Bhave, P.V., Zhang, K.M., Kovalcik, K., Pye, H.O.T. Near-road modeling and measurement of cerium-containing particles generated by nanoparticle diesel fuel additive use. *Environ. Sci. Technol.*, 48:10607 (2014).

Gantt, B., Hoque, S., Fahey, K.M., Willis, R.D., Delgado-Saborit, J.M., Harrison, R.M., Zhang, K.M., Jefferson, D.A., Kalberer, M., Bunker, K.L., Conny, J.M., Bhave, P.V., Weinstein, J.P., Pye, H.O.T. Factors affecting the ambient physicochemical properties of cerium-containing particles generated by nanoparticle diesel fuel additive use. *Aerosol Science and Technology*, 49:371 (2015).

Ault, A.P., Peters, T.M., Sawvel, E.J., Casuccio, G.S., Willis, R.D., Norris, G.A., Vicki H. Grassian. Single-Particle SEM-EDX analysis of iron-containing coarse particulate matter in an urban environment: sources and distribution of iron within Cleveland, Ohio, *Environ. Sci. Technol.* 46:4331 (2012).

Majestic, B.J., Erdakos, G.B., Lewandowski, M., Oliver, K.D., Willis, R.D., Kleindienst, T.E., Bhave, P.V. A review of selected engineered nanoparticles in the atmosphere: sources, transformations, and techniques for sampling and analysis. *Int. J. Occup. Environ. Health*. 16:483 (2010).

Zota A.R., Willis R., Jim R., Norris G.A., Shine J.P., Duvall R., Schaider, L.A., Spengler, J.D. Impact of mine waste on airborne respirable particulates in northeastern Oklahoma, United States. *J. Air Waste Manag. Assoc.* 59:1347 (2009).

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Education:

- Ph.D., Physics, Duke University, 1977
- B.S., Physics, Denison University, 1970

Professional Experience:

- Research Physicist, USEPA, ORD, NERL-HEASD, RTP, NC 2005-present
- Science Advisor, Alion Science and Technology, Inc., RTP, NC 2005
- Principal Scientist/Research Scientist, ManTech Environmental Technology, Inc., RTP, NC 1992-2005
- Senior Scientist/Scientist, Atom Sciences, Inc., Oak Ridge, TN 1983-1991
- Assistant Research Physicist III/II/I, Scripps Institution of Oceanography, La Jolla, CA and Guest Scientist, Oak Ridge National Laboratory, Oak Ridge, TN 1979-1983
- NRC Postdoctoral Research Associate, Naval Research Laboratory, Washington, DC 1977-1979