

MARC L. PITCHFORD

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EDUCATION

Wisconsin State University-Oshkosh	Physics	B.S.	1971
University of Nevada-Reno	Atmospheric Physics	M.S.	1974
University of Nevada, Reno	Physics	Ph.D.	1992

PROFESSIONAL INTERESTS

Dr. Pitchford has been involved in air quality monitoring and assessment research since 1974. In particular his interests and experience has been in leading technical teams responsible for the design and management of extensive aerosol and visibility monitoring studies and networks. Among his achievements is the design and oversight of the IMPROVE aerosol and visibility monitoring network which started with 20 sites in 1986 and continues to operate over 160 sites nationwide; the design and technical leadership of Project MOHAVE (1991 – 1996) and the BRAVO Study (1997 – 2004), both involved extensive field monitoring programs with ambient measurements and tracer release and monitoring followed by deterministic and receptor modeling for source attribution; and co-technical leader of the EPA PM Super Sites program that funded five university research partnerships to develop and operate sophisticated aerosol monitoring sites various urban areas. Dr. Pitchford has also acted as a visibility subject matter expert adviser to the US Environmental Protection Agency for the development and implementation of policy for visibility protection of national parks and wilderness areas, and for the review/revisions of the Secondary Particulate Matter National Ambient Air Quality Standards.

PROFESSIONAL EXPERIENCE

2011 to present:	Executive Director, Division of Atmospheric Sciences, Desert Research Institute, Reno, Nevada
1994 - 2011:	Meteorologist, NOAA/ARL/ Special Operations and Research Division, Las Vegas, Nevada
1978 - 1994:	Meteorologist, NOAA/ARL/Atmospheric Sciences Modeling Division, detailed to the EPA/Environmental Monitoring Systems Laboratory in Las Vegas, Nevada.
1975 - 1978:	Physicist, EPA
1975 - 1975:	Air Quality Scientist, Aerovironment Incorporated.
1974 - 1974:	Air Quality Scientist, Scientific Engineering Services Incorporated.

PROFESSIONAL ACTIVITIES AND MEMBERSHIPS

- Interagency Monitoring of Protected Visual Environments (IMPROVE) - Chair, Steering Committee (1985 – 2011)
- USDA Agriculture Air Quality Task Force – Member (2004 – 2006)
- Western Regional Air Partnership (WRAP) - Chair, Ambient Monitoring and Reporting Forum (1997 – 2006)
- Central States Regional Air Partnership (CenRAP) - Monitoring Workgroup member (2002 – 2006)
- Regional Planning Organizations, Technical Coordination - Co-chair, Data Analysis and Monitoring Committee (2002 – 2009)

- Columbia River Gorge Air Quality Study - Technical Advisory Committee Member (2003 – 2009)
- Air and Waste Management Association – Member (1980 – present)
- International Air Quality Advisory Board to the International Joint Commission (U.S. and Canada) - Technical Advisory Panel Member (2003 – 2006)

PUBLICATIONS

Peer Reviewed Journal Articles:

- So, R., Vingarzan, R., Jones, K., and Pitchford, M. L. 2015: Modeling of time-resolved light extinction and its applications to visibility management in the Lower Fraser Valley of British Columbia, Canada. *J. Air & Waste Manage. Assoc.*, **65**(6), 707-720.
- Cheng, Z., Jiang, J., Chen, C., Gao, J., Wang, S., Watson, J. G., Wang, H., Deng, J., Wang, B., Zhou, M., Chow, J. C., Pitchford, M. L., and Hao, J., 2015: Estimation of Aerosol Mass Scattering Efficiencies under High Mass Loading: Case Study for the Megacity of Shanghai, China. *Environ. Sci. Technol.*, **49**, 831-838.
- Hand, J. L., Schichtel, B. A., Malm, W. C., Pitchford, M. L., and Frank, N. H. 2014: Spatial and seasonal patterns in urban influence on regional concentrations of speciated aerosols across the United States. *J. Geophys. Res.: Atmos.*, **119**(22), 12832-12839, DOI: 10.1002/2014JD022328.
- Hand, J.L., Schichtel, B.A., Malm, W.C., Copeland, S., Molenaar, J.V., Frank, N., and Pitchford, M. 2014: Widespread reductions in haze across the United States from the early 1990s through 2011. *Atmos. Environ.*, **94**, 671-679. doi: 10.1016/j.atmosenv.2014.05.062.
- Hand, J. L., Schichtel, B. A., Malm, W. C., and Pitchford, M. L. 2012: Particulate sulfate ion concentration and SO₂ emission trends in the United States from the early 1990s through 2010. *Atmos. Chem. Phys.*, **12**, 10353-10365, doi: 10.5194/acp-12-10353-2012.
- Hand, J. L., Schichtel, B. A., Malm, W. C., Pitchford, M. L., and Frank, N. H. 2012: Seasonal composition of remote and urban fine particulate matter in the United States. *J. Geophys. Res.*, **117**, (D05209), Online, doi: 10.1029/2011JD017122.
- Schichtel, B. A., Rodriguez, M. A., Barna, M. G., Gebhart, K. A., Pitchford, M. L., and Malm, W. C. 2012: A semi-empirical, receptor-oriented Lagrangian model for simulating fine particulate carbon at rural sites. *Atmos. Environ.*, **61**, 361-370. doi: 10.1016/j.atmosenv.2012.07.017
- White, W. H., Farber, R. J., Malm, W. C., Nuttall, M., Pitchford, M. L., and Schichtel, B. A., 2012: Comment on "Effect of coal-fired power generation on visibility in a nearby National Park (Thorhorst and Berkman, 2010)". *Atmos. Environ.*, **55**, 173-178
- Murphy, D., Chow, J. C., Leibensperger, E., Malm, W., Pitchford, M. L., Schichtel, B., Watson, J. G., and White, W. 2011: Decreases in elemental carbon and fine particle mass in the United States. *Atmos.Chem.Phys.*, **11**(10), 4679-4686.
- Schichtel, B.A., Pitchford, M.L., and White, W.H., 2011: Comments on "Impacts of California's Air Pollution laws on Black Carbon and their Implication for Direct Radiative Forcing." *Atmos. Environ.*, **45**(24), 4116-4118.
- Malm, W.C., B.A. Schichtel, and M.L. Pitchford, 2011: Uncertainties in PM_{2.5} Gravimetric and Speciation Measurements and What Can We Learn from Them. *J. Air & Waste Manage. Assoc.*, **61**(11), 1131-1149.
- White, W.H., Farber, R.J., Malm, W.C., Nuttall, M., Pitchford, M.L., and Schichtel, B.A. 2010: Comment on "Effect of coal-fired power generation on visibility in a nearby National Park (Thorhorst and Berkman, 2010)". *Atmos. Environ.*, **55**, 173-178. doi: 10.1016/j.atmosenv.2012.02.076.

- Pitchford, M.L., Poirot, R.L., Schichtel, B.A., and Malm, W.C., 2009: Characterization of the Winter Midwestern Particulate Nitrate Bulge. *J. Air & Waste Manage. Assoc.*, **59**, 1061-1069.
- Kavouras, I.G., Etyemezian, V., DuBois, D.W., Xu, J., and Pitchford, M., 2009: Source Reconciliation of Atmospheric Dust Causing Visibility Impairment in Class I Areas of the Western United States". *J. Geophys. Res.-Atmospheres*, **114**, D02308, doi:10.1029/2008JD009923.
- Pitchford, M., W. Malm, B. Schichtel, N. Kumar, D. Lowenthal, and J. Hand, 2007: Revised Algorithm for Estimating Light Extinction from IMPROVE Particle Speciation Data. *J. Air & Waste Manage. Assoc.*, **57**, 1326-1336.
- Kavouras, I. G., V. Etyemezian, J. Xu, D. W DuBois, M. Green, and M. Pitchford, 2007: Assessment of the Local Windblown Component of Dust in the Western United States. *J. Geophys. Res.*, **112**, D08211, doi:10.1029/2006JD007832.
- Etyemezian, V., G. Nikolich, S. Ahonen, M. Pitchford, M. Sweeney, R. Purcell, J. Gillies, and H. Kuhns, 2007: The Portable In Situ Wind Erosion Laboratory (PI-SWERL): A New Method to Measure PM₁₀ Windblown Dust Properties and Potential for Emissions. *Atmos. Environ.*, **41**, 3789-3796.
- Malm, W.C., M.L. Pitchford, C., and McDade, L.L. 2007: Ashbaugh, Coarse Particle Speciation at Selected Locations in the Rural Continental United States. *Atmos. Environ.*, **41**, 2225-2239.
- Xu, J., D. DuBois, M. Pitchford, M. Green, and V. Etyemezian, 2006: Attribution of Sulfate Aerosols in Federal Class I Areas of the Western United States Based on Trajectory Regression Analysis. *Atmos. Environ.*, **40**, 3433-3447.
- Schichtel, B.A., W.C Malm, and M.L. Pitchford, 2006: Critique of "Precipitation in Light Extinction Reconstruction" by P.A. Ryan. *J. Air & Waste Manage. Assoc.*, **56**, 539-546.
- Schichtel, B.A., K.A. Gebhart, W.C Malm, M.G. Barna, M.L. Pitchford, E.M. Knipping, and I.H. Tombach, 2005: Reconciliation and Interpretation of Big Bend National Park Particulate Sulfur Source Apportionment: Results from the Big Bend Regional Aerosol and Visibility Observational Study – Part I. *J. Air & Waste Manage. Assoc.*, **55**, 1709-1725.
- Pitchford, M.L., B.A. Schichtel, K.A. Gebhart, W.C Malm, M.G. Barna, E.M. Knipping, I.H. Tombach, 2005: Reconciliation and Interpretation of Big Bend National Park Light Extinction Source Attribution: Results from the Big Bend Regional Aerosol and Visibility Observational Study – Part II. *J. Air & Waste Manage. Assoc.*, **55**, 1726-1732.
- Malm, W.C., B.A. Schichtel, M.L. Pitchford, L.L. Ashbaugh, and R.A. Eldred, 2004: Spatial and Monthly Trends in Speciated Fine Particle Concentration in the United States. *J. Geophys. Res.*, **109**, D03306.
- Etyemezian, V., H. Kuhns, J. Gillies, M. Green, M. Pitchford, and J. Watson, 2003: Vehicle-Based Road Dust Emissions Measurement (I): Methods and Calibration. *Atmos. Environ.*, **36**, 4559-4571.
- Kuhns, H., V. Etyemezian, M. Green, K. Hendrickson, M. McGown, K. Barton, and M.L. Pitchford, 2003: Vehicle-Based Road Dust Emissions Measurement (II): Effect of Precipitation, Wintertime Road Sanding, and Street Sweepers on PM₁₀ Fugitive Dust Emissions from Paved and Unpaved Roads. *Atmos. Environ.*, **36**, 4572-4582.
- Etyemezian, V., H. Kuhns, J. Gillies, J. Chow, K. Hendrickson, M. McGown, and M. Pitchford, 2003: Vehicle Based Road Dust Emissions Measurement (III): Effect of Speed, Traffic , Location, and Season on PM₁₀ Road Dust Emissions. *Atmos. Environ.*, **36**, 4583-4593.
- Green, M., H. Kuhns, M. Pitchford, R. Dietz, L. Ashbaugh, and T. Watson, 2003: Application of the Tracer-Aerosol Gradient Interpretive Technique (TAGIT) to Sulfur Attribution for the Big Bend

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- Peters, T.M., G.A. Norris, R.W. Vanderpool, D.B. Bemmil, R.W. Wiener, R. W. Murdoch, F.F. McElroy, M. L. Pitchford, 2001: Field Performance of the PM_{2.5} Federal Reference Method Samplers. *Aerosol Sci. Technol.*, **34**, 433-443.
- Kuhns, H., V. Etyemezian, D. Landwehr, C. McDougall, M.L. Pitchford, M. Green, 2001: Testing Re-entrained Aerosol Kinetic Emissions from Roads (TRAKER): A New Approach to Infer Silt Loading on Roadways. *Atmos. Environ.*, **35**(16) 2815-2825.
- Pitchford, M.L., M. Green, H. Kuhns, and R.J. Faber, Characterization of Regional Transport and Dispersion Using Project MOHAVE Tracer Data. *J. Air Waste Manage. Assoc.*, **50**(5) 733-745, 2000.
- Kuhns, H., M. Green, M. L., Pitchford, L. Vasconcelos, W. White, and V. Mirabella, 1999: Attribution of Particulate Sulfur in the Grand Canyon to a Specific Point Source using Tracer-Aerosol Gradient Interpretive Technique (TAGIT). *J. Air Waste Manage. Assoc.*, **49**(8) 906-915.
- White, W.H., E.S. Macias, L.A. Vasconcelos, R. Faber, V.A. Mirabella, M.C. Green, and M.L. Pitchford, 1999: Tracking Regional Background in Haze Attribution Experiment. *J. Air Waste Manage. Assoc.*, **49**(5) 599-602.
- Malm, W. C., and M. L. Pitchford, 1997: Comparison of Calculated Sulfate Scattering Efficiencies as Estimated from Size-Resolved Particle Measurements at Three National Locations. *Atmos. Environ.*, **31**(9) 1315-1325.
- Johnson, B. J., M. L. Pitchford, H. C. Ayoub, M. H. Naylor, and S. C. Huang, 1997: Preliminary On-Road Measurement of the Effects of Oxygenated Fuel on CO Emissions Near Las Vegas, Nevada. *J. Air Waste Manage. Assoc.*, accepted for publication.
- Pitchford, M. L., and M. C. Green, 1997: Analyses of Sulfur Size Distributions for a Forty-Day Period in Summer 1992 at Meadview, Arizona. *J. Air Waste Manage. Assoc.*, **47**, 201-211.
- Green, M. C., M. L. Pitchford, and L. Ashbaugh, Identification of Candidate Clean Air Corridors for the Colorado Plateau, *J. Air Waste Manage. Assoc.*, **46**, 441-449, 1996.
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- Pitchford, M. L. and P. H. McMurry, 1994: Relationship Between Measured Water Vapor Growth and Chemistry of Atmospheric Aerosol for Grand Canyon, Arizona in Winter, 1990. *Atmos. Environ.*, **28**, 827-840.
- Malm, M. C., J. Trijonis, M. L. Pitchford, and R. L., 1994: Dennis, Assessing the Effects of SO₂ Emission Changes on Visibility. *Atmos. Environ.*, **28**, 1023-1034.
- Pitchford, M. L., and B. J. Johnson, Empirical Model of Vehicle Emissions. *ES&T*, **27**, 741-748, 1993.
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- Prowell, G. H., M. R. McGown, R. Viswanathan, J. L. McElroy, and M. L. Pitchford, 1989: Split Level Plumes. *JAPCA*, **39**, pp 841-851.

- Pitchford, M. L., and A. Pitchford, 1985: Analysis of Regional Visibility in the Southwest Using Principal Component and Back Trajectory Techniques. *Atmos. Environ.*, **19**(8).
- Pitchford, M. L., and D. J. Allison, 1984: Lake Tahoe Visibility Study. *Air Poll. Cont. Assoc.*, **34**(3).
- Eldred, R. A., L. L. Ashbaugh, T. A. Cahill, R. G. Flocchini, and M.L. Pitchford, 1983: Sulfate Levels in the Southwest During the 1980 Copper Smelter Strike. *J. Air Poll. Cont. Assoc.*, **33**(2).
- Pitchford, M. L., 1982: The Relationship of Regional Visibility to Coarse and Fine Particle Concentration in the Southwest. *J. Air Poll. Cont. Assoc.*, **32**(8).
- Malm, W. C., M. L. Pitchford, and A. Pitchford, 1982: Site Specific Factors Influencing Visual Range Calculated from Teleradiometer Measurements. *Atmos. Environ.*, **16**(15).
- Pitchford, A. M., M. L. Pitchford, W.C. Malm, R. Flocchini, T. A. Cahill, and E. Walther, 1981: Regional Analysis of Factors Affecting Visual Air Quality. *Atmos. Environ.* **15**, 2043-2054.
- Flocchini, R. G., T. A. Cahill, M. L. Pitchford, R. A. Eldred, P. J. Feeney, and L. L. Ashbaugh, 1981: Characterization of Particles in the Arid West. *Atmos. Environ.* **15**, 2017-2030.
- Pitchford, M. L., R. G. Flocchini, R. G. Draftz, T. A. Cahill, L. L. Ashbaugh, and R. A. Eldred, 1981: Silicon in Submicron Particles in the Southwest. *Atmos. Environ.*, **15**, 321-333.
- Flocchini, R. G., T. A. Cahill, L. L. Ashbaugh, R. A. Eldred, and M. L. Pitchford, 1981: Seasonal Behavior of Particulate Matter at Three Rural Utah Sites. *Atmos. Environ.* **15**, 315-320.

Published Papers:

- Hand, J., Copeland, S., McDade, C., Day, D., Moore, J., Dillner, A., Pitchford, M. L., Indresand, H., Schichtel, B., Malm, W., and Watson, J. G., 2011: Spatial and seasonal patterns and temporal variability of haze and its constituents in the United States, *IMPROVE Report V*. Cooperative Institute for Research in the Atmosphere.
- Pitchford, M.L., Poirot, R.L., Schichtel, B.A., Malm, W.C., Characterization of the Winter Midwestern Particulate Nitrate Bulge, paper #20, presented at the Visibility Specialty Conference in Moab, UT, April 29 – May 2, 2008.
- Copeland, S.A., Pitchford, M.L., Ames, R., Regional Haze Rule Natural Level Estimates Using the Revised IMPROVE Aerosol Reconstructed Light Extinction Algorithm, paper #48, presented at the Visibility Specialty Conference in Moab, UT, April 29 – May 2, 2008.
- Molenar, J., Pitchford, M.L., Sky Color and Cloud's Appearance: Sensitive Indicators of Urban Visual Air Quality, poster paper #18, presented at the Visibility Specialty Conference in Moab, UT, April 29 – May 2, 2008.
- Malm, W.C., B.A. Schichtel, M.L. Pitchford, L.L. Ashbaugh, R.A. Eldred, An Update of Spatial and Monthly Trends in Speciated Fine Particle Concentration in the United States, Proceedings of the Regional and Global Perspectives on Haze: Causes Consequences and Controversies Visibility Specialty Conference, Available from the Air and Waste Management Association, 2004.
- Pitchford, M.L., B.A. Schichtel, K.A. Gebhart, M.G. Barna, W.C. Malm, I.H. Tombach, E.M. Knipping, Causes of Haze at Big Bend National Park – Results of the BRAVO Study and More, Proceedings of the Regional and Global Perspectives on Haze: Causes Consequences and Controversies Visibility Specialty Conference, Available from the Air and Waste Management Association, 2004.
- Etyemezian, V., J. Xu, D. Dubois, M.Green, L. Alter, M. Pitchford, Assessment of the Major Causes of Dust-Resultant Haze in the Western United States, Proceedings of the Regional and Global

- Perspectives on Haze: Causes Consequences and Controversies Visibility Specialty Conference, Available from the Air and Waste Management Association, 2004.
- DeBell, L.J., W.C. Malm, B.A. Schichtel, M.L. Pitchford, L.L. Ashbaugh, C. McDade, N. Hyslop, D. Fox, Overview of the IMPROVE Network's Quality Assurance, Procedures and Introduction to Our New Interactive Webbased Tools, Proceedings of the Regional and Global Perspectives on Haze: Causes Consequences and Controversies Visibility Specialty Conference, Available from the Air and Waste Management Association, 2004.
- Xu, J., D. DuBois, M. Green, D. Freeman, V. Etyemezian, M. Pitchford, Causes of Haze Assessment for WRAP Class I Areas – Preliminary Conceptual Model Development, Procedures and Introduction to Our New Interactive Webbased Tools, Proceedings of the Regional and Global Perspectives on Haze: Causes Consequences and Controversies Visibility Specialty Conference, Available from the Air and Waste Management Association, 2004.
- Schichtel, B.A., K.A. Gebhart, W.C. Malm, M.G. Barna, M. Pitchford, E. Knipping, Reconciliation and Interpretation of Particulate Sulfate Source Apportionment Results at Big Bend National Park, Proceedings of the Regional and Global Perspectives on Haze: Causes Consequences and Controversies Visibility Specialty Conference, Available from the Air and Waste Management Association, 2004.
- Green, M.C. D. DuBois, J. Xu, M.L. Pitchford, Westward Transport of Sulfate Rich Haze from the Eastern United States, Proceedings of the Regional and Global Perspectives on Haze: Causes Consequences and Controversies Visibility Specialty Conference, Available from the Air and Waste Management Association, 2004.
- Malm, W.C., R.B. Ames, L.L. Ashbaugh, R.A. Eldred, M.L. Pitchford, A Ten-Year Spatial and Temporal Trend of Sulfate across the United States, Proceedings of the Regional Haze and Global Radiation Balance – Aerosol Measurements and Models: Closure, Reconciliation and Evaluation Conference, Available from the Air and Waste Management Association, 2001.
- Pitchford, M.L., M. Green, H. Kuhns, V. Etyemezian, R. Dietz, T. Watson, Perfluorocarbon Tracers Used to Study Transport and Dispersion during the BRAVO Study, Proceedings of the Regional Haze and Global Radiation Balance – Aerosol Measurements and Models: Closure, Reconciliation and Evaluation Conference, Available from the Air and Waste Management Association, 2001.
- Pitchford, M.L., N. Frank, R. Damberg, M. Scruggs, W.C. Malm, S. Silva, R. Fisher, S. Archer, R. Poirot, D. Ely, R. Lebens, T. Moore, R. Eldred, and L. Ashbaugh, Expanded IMPROVE Network for Regional Haze Monitoring, Presented at the 93rd Annual Meeting of the Air and Waste Management Association, 2000.
- Johnson, B. J., M. L. Pitchford, H. C. Ayoub, M. H. Naylor, and S. C. Huang, Remote Sensing of Vehicular CO Emissions for Oxyfueled and Non-oxyfueled Fleets in Clark County, Nevada, Paper no. 94-RA106.06, Presented at the 87th Annual Meeting of the Air and Waste Management Association, 1994.
- Pitchford, M. L., B. V. Polkowsky, M. R. McGown, W. C. Malm, J. V. Molenaar, and L. Mauch, Percent Change in Extinction Coefficient: A Proposed Approach for Federal Visibility Protection Strategy, In: Visibility and Fine Particles, a peer-reviewed transactions volume, C. V. Mathai editor, Air and Waste Management Association, 1990.
- Polkowsky, B. V. and M. L. Pitchford, Discussion of Federal Regulatory Approaches for Addressing Regional Visibility Impairment, In: Visibility and Fine Particles, a peer-reviewed transactions volume, C. V. Mathai editor, Air and Waste Management Association, 1990.

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- Malm, W. C., M. L. Pitchford, and H. K. Iyer, Design and Implementation of the Winter Haze Intensive Tracer Experiment - WHITEX, In: Receptor Models in Air Resources Management, a peer-reviewed transactions volume, J. G. Watson editor, Air and Waste Management Association, 1989.
- Eldred, R. A., T. A. Cahill, M. L. Pitchford, and W. C. Malm, IMPROVE - A New Remote Area Particulate Monitoring System for Visibility Studies, Presented at the APCA 81st. Annual Meeting and Exhibition, June, 1988.
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- Tombach, I., W. C. Malm, and M. L. Pitchford, Performance Criteria for Monitoring Visibility-Related Variables, In: Visibility Protection: Research and Policy Aspects, a peer-reviewed transactions volume, P.S. Bhardwaja editor, Air Pollution Control Association, 1987.
- Blumenthal, D. L., J. Trijonis, R. Kelso, M. L. Pitchford, M. McGown, T. Dodson, R. G. Flocchini, A. Pitchford, A. Waggoner, and J. Ouimette, Design and Initial Findings of the RESOLVE (Research on Operations-Limiting Visual Extinction) Desert Visibility Study, In: Visibility Protection: Research and Policy Aspects, a peer-reviewed transactions volume, P. S. Bhardwaja editor, Air Pollution Control Association, 1987.
- Trijonis, J. C., M. L. Pitchford, and M. McGown, Preliminary Extinction Budget Results from the RESOLVE Program, In: Visibility Protection: Research and Policy Aspects, a peer-reviewed transactions volume, P. S. Bhardwaja editor, Air Pollution Control Association, 1987.
- Joseph, D. B., J. Metsa, W. C. Malm, and M. L. Pitchford, Plans for IMPROVE: A Federal Program to Monitor Visibility in Class I Areas. In: Visibility Protection: Research and Policy Aspects, a peer-reviewed transactions volume, P. S. Bhardwaja editor, Air Pollution Control Association, 1987.
- Pitchford, M. L. and A. Pitchford. Development and Application of an Approach for Specifying the Influence of Upwind Areas Using Trajectory Analysis, Presented at the 77th Annual Meeting of the Air Pollution Control Association, June 1984.
- McDade, C. E., Davis, S. L., W. F. Barnard, M. L. Pitchford, and J. L. Littlejohn, External Quality Assurance in Visibility Monitoring, Presented at the 75th Annual Meeting of the Air Pollution Control Association, June 1982.
- Ashbaugh, L. L., J. B. Barone, T. A. Cahill, R. A. Eldred, R. G. Flocchini, and M. L. Pitchford, Characterization of Particle Episodes in the Arid West, Presented at the 74th Annual Meeting of the Air Pollution Control Association, June 1981.
- Malm, W. C., M. L. Pitchford, and S. F. Archer, Comparison of Electro-Optical Measurements Made by Various Visibility Monitoring Instruments, Presented at the APCA Meeting "View on Visibility - Regulatory and Scientific," Denver, Colorado: November 1979.
- Kriess, W. I., M. L. Pitchford, and J. Lansinger, Field Testing of a Long Path Laser Transmissometer Designed for Atmospheric Visibility Measurements, Presented at the Annual SPIE Conference, San Diego, California; August 1977.

REPORTS:

USEPA, Policy Assessment for the Review of the PM NAAQS (April 2011)

http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_index.html, 2011.

USEPA Particulate Matter Urban Focused Visibility Assessment,

http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_index.html, 2010.

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Pitchford, M.L., Green, M.C., Morris, R., Emory, C., Sakata, R., Swab, C., and Mairose P.T., Columbia River Gorge Air Quality Study: Science Summary Report, available at

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