

Joanne R. Wendelberger

Statistical Sciences Group, CCS-6, MS-F600
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Career Objectives

Promote the use and development of statistical methods in the investigation of problems of scientific and national interest through leadership, statistical research, consulting, and professional activities.

Education

- 1987-1991 Ph.D. in Statistics, University of Wisconsin, Department of Statistics and Center for Quality and Productivity Improvement; Research topic: Impact, Identification and Estimation of Sources of Transmitted Variation; Thesis Advisor: Professor George Box; Minor: Mathematics; 3.9 GPA.
- 1981-1983 M.S. in Statistics, University of Wisconsin, 3.8 GPA.
- 1977-1981 B.A. with majors in Mathematics and Economics, Oberlin College, Oberlin, Ohio, 3.7 GPA.

Experience

- 8/08-Present *Deputy Group Leader*, Statistical Sciences Group, CCS-6, Los Alamos National Laboratory.
- 5/08-7/08 *Acting Group Leader*, Statistical Sciences Group, CCS-6, Los Alamos National Laboratory. Temporary 3 month assignment.
- 1/05-4/08 *Deputy Group Leader*, Statistical Sciences Group, CCS-6, Los Alamos National Laboratory.
- 1999-2004 *Project Leader*, Statistical Sciences Group, Los Alamos National Laboratory.
- 1992-1999 *Technical Staff Member*, Statistical Sciences Group, Los Alamos National Laboratory.
- 1984-1992 *Statistical Consultant*, Consultant to General Motors Research Laboratories and Chevrolet-Pontiac-GM of Canada Group.
- 1977-1982 *Statistical Consultant*, College of Agricultural and Life Sciences, University of Wisconsin.
- 1977-1983 *Research Assistant*, Department of Statistics, University of Wisconsin.
- 1981-1982 *Fellow*, Department of Statistics, University of Wisconsin.
- 1980 *Teaching Assistant*, Department of Mathematics, Oberlin College.
- 1980 *Instructor*, Oberlin College Upward Bound Program.

Current Research Interests

Statistical Issues in Cyber Security
Experimental Design/Resource Allocation
Material Aging and Degradation
Statistical Population Bounding
Functional Data Analysis

Honors and Awards

- 2008 Los Alamos Achievement Award
- 2005 Fellow of the American Statistical Association
- 2002-2003 4 NNSA Awards of Excellence
- 2002 Los Alamos Achievement Award
- 1999 Los Alamos Teamwork Award
- 1981 Wisconsin Alumni Research Foundation Fellowship
- 1979 Phi Beta Kappa

Professional Activities/Service

- American Statistical Association, member.
 - *Technometrics*, Associate Editor (2001-2004)
 - Section on Physical & Engineering Sciences (SPES), Chair-Elect, Chair, Past-Chair (2004-2006); SPES Program Chair, Joint Statistical Meetings Program Committee (2001), SPES Joint Statistical Meetings Mixer Coordinator (1994), Joint Statistical Meetings Invited Roundtable Discussion Leader, “Statistical Issues in Cyber Security,” (2008).
 - Albuquerque Chapter, President (1995-1998).
 - ASA Council of Chapters Traveling Course, Albuquerque Site Coordinator (1997)
 - Detroit Chapter, Council of Chapters Representative (1990-1992)
 - W. J. Youden Award for Interlaboratory Testing Committee, Member (1998-2003), Chair (2000-2003)
 - SPES/IMS Spring Research Conference on Statistics in Industry and Technology, Conference Co-Chair (1998), Conference Management Committee (2003-2004)
 - Invited Session Organizer for Joint Statistical Meetings, Spring Research Conference on Statistics in Industry and Technology, and Symposium on the Interface of Computing Science and Statistics, and Mathematical Methods in Reliability Conference.
 - American Society for Quality, Chemical and Process Industries Division, Paper Awards Issue Nominator/Judge for Technometrics Frank Wilcoxon and Jack Youden prizes (2006, 2007)

- American Society for Quality, member.
 - *Technometrics* Management Committee (2009-present)
 - Paper Awards Issue Nominator/Judge for *Technometrics* Frank Wilcoxon and Jack Youden prizes (2006, 2007, 2009)
- Mathematical Association of America, member.
- The Institute of Mathematical Statistics, member.
- Society for Industrial and Applied Mathematics, member.
- 2003, 2005, 2008 Expanding Your Horizons Technical Workshop for young women in grades 8-10. “Adventures in Uncertainty” Workshop Presenter.
- 2006-2007 Math Counts coach at Barranca Mesa Elementary.
- 2004 Co-organized “Introduce a Girl to Engineering” workshop for 5th and 6th grader Girl Scouts.
- 2002 New Mexico High School Supercomputing Challenge, Seminar Presenter.
- 1999 Careers and Curiosity Workshop. Provided statistics demonstrations and career information to 5th and 6th Graders at Barranca Mesa Elementary.
- 1998-2006, Barranca Mesa Elementary, provided statistics demos for students in Grades K-6.

Selected Publications and Reports

Vardeman, S., Hamada, S., Burr, T., Wendelberger, J., Moore, L., Morris, M., Wu, H., and Jobe, J. (2009), “Elementary Statistical Methods and Measurement,” LA-UR-09-02208, submitted to *The American Statistician*.

Wendelberger, J., Moore, L., and Hamada, M. (2009), “Making Tradeoffs in Designing Scientific Experiments: A Case Study with Multi-Level Factors,” *Quality Engineering*, V. 21, 2, 143-155.

Catlett, C. et al, “A Scientific Research and Development Approach to Cyber Security,” report submitted to the Department of Energy, December 2008, available at <https://wiki.cac.washington.edu/display/doi/Home>.

Wendelberger, Joanne (Los Alamos National Laboratory), Talbot, E. (Sandia National Laboratory), Griffin, C. (Oak Ridge National Laboratory), Wilder, L. (Oak Ridge), Jiao, Y. (Oak Ridge), Kolda (Sandia), T., Scherrer, C (Pacific Northwest National Laboratory), “Mathematical Underpinnings for Science-Based Cyber Security,” White Paper prepared for Department of Energy, Office of Science, available at <https://wiki.cac.washington.edu/display/doi/Home>.

Wendelberger, Joanne R., Hockett, Jennifer C., and Meeker, William Q., “Methods for Planning Repeated Measures Degradation Studies,” LA-UR-07-4106.

S. Vardeman, Iowa State University, J. Wendelberger, D-1, and L Wang, MST-6, “Calibration, Error Analysis, and Ongoing Measurement Process Monitoring for Mass Spectrometry,” appeared in *Quality Engineering*, 18, 2, 2006.

Vardeman, Stephen B., Leyva-Estrada, Norma, Wendelberger, Joanne R., Huckett, Jennifer C., and Fletcher, Michael A., "Bayes Statistical Analysis of Sieving Data," LA-UR-06-3977, Ph.D. thesis section, Iowa State University.

Huckett, Jennifer C. and Wendelberger, Joanne R., "Comparison of Particle Size Data for PBX9501," LA-UR-05-5710.

Wendelberger, Joanne, Moore, Leslie, and Hamada, Michael, "Design Tradeoffs in Scientific Experiments," LA-UR-03-8142.

Vardeman, Stephen and Wendelberger, Joanne, "The Expected Sample Variance of Uncorrelated Random Variables With a Common Mean and an Application in Unbalanced Random Effects Models," *Journal of Statistical Education*, Vol. 13, No. 1, March, 2005.

Hamada, Michael, Johnson, Valen, Moore, Leslie, and Wendelberger, Joanne, "Bayesian Prediction Intervals and their Relationship to Tolerance Intervals," *Technometrics*, Vol. 46, 4, 452-459, 2004.

Marron, J.S., Wendelberger, J., and Kober, E., "Time Series Functional Data Analysis," LA-UR-04-3911, submitted to *Journal of Computational Graphics and Statistics*, 2003.

Wendelberger, Joanne and Huckett, Jennifer, "Development of a Test Plan for Repeated Measures Data," Los Alamos National Laboratory Report, LA-UR-04-7039.

Hamada, M., Pohl, A., Spiegelman, C. and Wendelberger, J. "A Bayesian Approach to Calibration Intervals and Properly Calibrated Tolerance Intervals," *Journal of Quality Technology*, Vol. 35, No. 2, April 2003.

Moore, Leslie M. and Wendelberger, Joanne R., "Statistical Uncertainty Bounds for Polymer Degradation in High Explosives," Los Alamos National Laboratory Report, LA-UR-99-4135, 1999.

Beckman, Richard J., Fernandez, Nancy J., Ramsay, John, and Wendelberger, Joanne R., "Statistical Analysis of High Explosive Detonation Data," Los Alamos National Laboratory Report, LA-UR-98-2253, 1998.

Wendelberger, Joanne R., "Availability Growth Modeling," Los Alamos National Laboratory Report, LA-UR-98-2678, 1998.

Wendelberger, Joanne R., Fernandez, Nancy J., and Hemphill, GERALYN M., "A Guide to Tolerance Intervals," Los Alamos National Laboratory Report, LA-UR-97-1897, 1997.

Wendelberger, Joanne R., "Statistical Methods for Nondetect Data," Los Alamos National Laboratory Report, LA-UR-97-117.

McKay, M. D., Morrison, J. D., and Wendelberger, J. R., "Model Uncertainty in Stochastic Simulation Models," Los Alamos National Laboratory Report, LA-UR-97-1366, 1997.

McKay, M. D., Wendelberger, J. R., and Morrison, J. D., "Evaluating Uncertainty in Stochastic Simulation Models," Los Alamos National Laboratory Report, LA-UR-96-3651, 1997.

Wendelberger, Joanne R., McKay, Michael D., and Morrison, John, D., "A Statistical Framework for Model Evaluation," Los Alamos National Laboratory Report, LA-UR-96-4509, 1996.

Wendelberger, Joanne R., "Using Tolerance Bounds in Scientific Investigations," *Proceedings of the 1996 American Statistical Association Meeting, Section on Physical and Engineering Sciences*, 1996.

Wendelberger, Joanne R. and Gilbert, Richard O., "Nondetects: Planning and Statistical Analysis to Mitigate their Effects," Department of Energy *DQO Statistics Bulletin*, Vol. 1, No. 2, Pacific Northwest National Laboratory, 1995.

Wendelberger, Joanne R., "Methods for Handling Values Below Detection Limits," LA-UR-95-3502, *Proceedings of the 1995 American Statistical Association Meeting, Section on Statistics and the Environment*, 1995.

Wendelberger, Joanne R. and McVittie, Thomas I., "Data Management and Statistical Analysis for Environmental Assessment," invited paper, *Proceedings of Interface 95, 27th Symposium on the Interface of Computing Science and Statistics*, 1995.

Wendelberger, Joanne and Campbell, Katherine, "Non-Detect Data in Environmental Investigations," Los Alamos National Laboratory Report, LA-UR-94-1856.

Wendelberger, Joanne R. and Beckman, Richard J., invited discussion of "The Use of Conditional Simulation in Nuclear Waste Site Performance Assessment" by Carol Gotway, *Technometrics*, Vol. 36, 2, 144-147, 1994.

Wendelberger, Joanne R., Review of *Statistics and Society, Data Collection and Interpretation*, by Walter T. Federer, *Technometrics*, Vol. 36, 3, 329-330, 1994.

Wendelberger, Joanne R., Review of *Adventures in Stochastic Processes*, by Sidney Resnick, *Technometrics*, Vol. 35, 4, 461, 1993.

Wendelberger, Joanne R., "Environmental Screening Studies With Censored Data," Los Alamos National Laboratory Report, LA-UR-93-4156, 1993.

Wendelberger, Joanne R., "Efficiency Effects of Variation in Controlled Experimental Variables," *Proceedings of the 1993 American Statistical Association Meeting, Section on Physical and Engineering Sciences*, 1993.

Wendelberger, Joanne and Box, George, "Identification and Estimation of Sources of Transmitted Variation," *Proceedings of the 1992 American Statistical Association Meeting, Section on Physical and Engineering Sciences*, 1992.

Wendelberger, Joanne R., *Impact, Identification and Estimation of Sources of Transmitted Variation*, Ph.D. thesis, University of Wisconsin-Madison, 1991.

Wendelberger, Joanne R., "Using SAS Software in the Design and Analysis of Two-Level Fractional Factorial Experiments," *Proceedings of the 1986 SAS Users Group International Conference*, 1986.

Internal client publications for General Motors Research Laboratories, 1984-1988.

Presentations

Wendelberger, Joanne R., "Statistical Design and Analysis of Corrosion Experiments," LA-UR-08-05001, presented at the 2008 Joint Statistical Meetings, Denver, Colorado, Aug. 3-7, 2008.

Wendelberger, Joanne R., "Materials Degradation Experiments," LA-UR-08-3629, invited presentation, 2008 Quality and Productivity Research Conference, Madison, Wisconsin, June 4-6, 2008.

Kim Thomas, STBPO-PO, Izabela Stroe, MPA-NHMFL, Joanne Wendelberger, CCS-6, Shannon McDaniel, MST-16, and Georgia Pedicini, HPC-4, "Career Paths for Women in the Sciences and Science-Related Fields," panel discussion sponsored by Los Alamos Women in Science and the LANL Student Programs Office, July 19, 2007.

Wendelberger, Joanne, R. "Experiments with Changes in the Design Region," LA-UR-07-3586, presented at the 2007 Quality and Productivity Research Conference, Santa Fe, New Mexico, June 4-6, 2007.

Wendelberger, Joanne, R. "40 Years of Statistics at Los Alamos," LA-UR-07-3626, presented at the 2007 Quality and Productivity Research Conference, Santa Fe, New Mexico, June 4-6, 2007.

Wendelberger, Joanne R., and Heath, Cynthia E., "Quantifying Uncertainty in Hydrodynamic Behavior of Spheres in Fluids," LA-UR-07-3397, invited presentation, 2007 Spring Research Conference on Statistics in Industry and Technology, Ames, Iowa, May 21-23, 2007.

Wendelberger, Joanne R., "Statistical Design of Experiments in the Presence of Restrictions and Constraints," LA-UR-07-1805, U. of Wisconsin Statistics Department Seminar, Madison, Wisconsin, March 21, 2007.

Wendelberger, Joanne R. "Collaboration with Nonstatisticians," LA-UR-06-5401, invited presentation, 2006 Joint Statistical Meetings, Seattle, Washington, Aug. 7-10, 2006.

Wendelberger, Joanne R., "Investigation of Functional Data Analysis Techniques for Chemical Spectra," LA-UR-06-3979, selected for presentation at the Joint Research Conference on Statistics in Quality, Industry, and Technology, Knoxville, Tennessee, June 8, 2006.

Wendelberger, Joanne R., Hockett, Jennifer C., and Meeker, William Q., "Development of a Test Plan for Repeated Measures Degradation Data," LA-UR-05-9612, presented at the Design and Analysis of Experiments Conference, Santa Fe, NM October 13, 2005.

Wendelberger, Joanne R., "Spectral Data and Functional Data Analysis," LA-UR-05-7163, Invited Presentation, American Statistical Association, Albuquerque Chapter Meeting, Santa Fe, New Mexico, September 16, 2005.

Wendelberger, Joanne R. and Moore, Leslie M., "Designing an Aging Study," LA-UR-05-6055, paper presented in Invited Case Study Session at the Joint Statistical Meetings, Minneapolis, Minnesota, Aug. 7-11, 2005.

Wendelberger, Joanne R., "Statistical Design and Analysis Techniques for Materials Testing and Development," LA-UR-04-7200, paper selected for presentation at the Fall Technical Conference, Roanoke, Virginia, October 14-15, 2004.

Wendelberger, Joanne R. and Moore, Leslie M., "Experiment Design in the Presence of Restricted Factor Combinations and Resource Constraints," LA-UR-04-5312, presented at Joint Statistical Meetings, Toronto, Ontario, Canada, August 8-12, 2004.

Moore, Leslie M. and Wendelberger, Joanne R., invited presentation by L. Moore, 4th International Conference on Mathematical Methods in Reliability, Santa Fe, New Mexico, June 21-24, 2004.

Wendelberger, Joanne R. and Moore, Leslie M., "Experiment Design in the Presence of Restricted Factor Combinations and Resource Constraints," LA-UR-04-3419, invited presentation, Spring Research Conference, Gaithersburg, Maryland, May 19-21, 2004.

Wendelberger, Joanne R., "Prediction and Bounding of Degradation Paths," LA-UR-03-0643, invited presentation at Joint Statistical Meetings, San Francisco, California, August 11-15, 2003.

Kober, Edward M., Wendelberger, Joanne R., and Marron, J. S., "Functional Data Analysis Tools for Analyzing Complex Time-Dependent Spectra," poster presented at the D/T Scientific Workshop, May 6, 2003.

Wendelberger, Joanne R., "Statistical Evaluation of Material Aging and Degradation," LA-UR-02-7407, invited presentation to ASM International, Los Alamos Chapter, December 11, 2002.

Wendelberger, Joanne R. and Moore, Leslie M., "Experiments for Statistical Evaluation of Aging Materials," LA-UR-02-4108, presented at the Joint Statistical Meetings, New York, New York, August 11-15, 2002.

Wendelberger, Joanne R. and Moore, Leslie M., "Design Tradeoffs in Scientific Experiments," LA-UR-02-0312, invited paper presented at the Quality and Productivity Research Conference, Arizona State University, June 5-7, 2002.

Wendelberger, Joanne R. and Moore, Leslie M., "Design of a Multi-Level Materials Experiment," presented at the Spring Research Conference, Ann Arbor, Michigan, May 20-22, 2002.

Wendelberger, Joanne R., "Collaborations That Work!" LA-UR-03-3638, introductory remarks for invited panel discussion on Collaboration in Industry, Academia, and Government, presented at the Spring Research Conference, Dayton, Ohio, May 20-22, 2002.

Wendelberger, Joanne R., "Statistical Assessment of Aging Materials," presented at the Army Conference on Applied Statistics, October 24-26, 2001.

Wendelberger, Joanne R., "Statistical Evaluation of Material Aging and Degradation," LA-UR-01-5678, selected for presentation at the Fall Technical Conference, Toronto, Ontario, Canada, October 19, 2001.

Hemphill, GERALYN, Moore, Leslie, Wendelberger, Joanne, Johnson, Valen, and Harradine, David, "Tolerance Bounds for Assessing Changes in Gas Level Over Time," LA-UR-01-1059, poster presented by GERALYN Hemphill at the Graybill Linear Models Conference, Ft. Collins, Colorado, June 13-15, 2001.

Wendelberger, Joanne R., "Assessment of Year-Round-School and Other Educational Issues," LA-UR-01-254, presented at the Los Alamos Women in Science Seminar Series, January 18, 2001.

Wendelberger, Joanne R. and Moore, Leslie M., "Degradation Modeling in the Presence of Measurement Changes," LA-UR-00-2691, presented at the Joint Research Conference on Statistics in Quality, Industry, and Technology, Seattle, Washington, June 26-29, 2000.

Moore, Leslie M. and Wendelberger, Joanne R. "Statistical Issues in Growth and Degradation Modeling," LA-UR-99-2801, invited presentation, American Statistical Association Meetings, Baltimore, MD, Aug. 9, 1999.

Baggerly, Keith, Drew, Mark, and Wendelberger, Joanne (1999), "Computer-Intensive Statistical Bounds for Growth and Degradation Processes," LA-UR-3286, invited presentation, American Statistical Association Meetings, Baltimore, MD, Aug. 9, 1999.

Moore, Leslie M. and Wendelberger, Joanne R. (1999), "Statistical Uncertainty Bounds for Polymer Degradation in High Explosives," LA-UR-1318, poster presented at the International Conference on Aging Studies and Lifetime Extensions of Materials, Oxford, United Kingdom, July 12-14, 1999.

Mulford, R. N., Brown, W., Huntley, T., Olivas, D., and Wendelberger, J., (1999), "A Survey of Plutonium Characteristics as a Function of Age: The ARIES Sampling Program," LA-UR-99-3285, International Conference on Aging Studies and Lifetime Extension of Materials," Oxford, United Kingdom, July 12-14, 1999.

Wendelberger, Joanne R., "Analysis of Bivariate Relationships in Explosives Test Data," LA-UR-98-503, Spring Research Conference on Statistics in Industry and Technology, Santa Fe, New Mexico, June 3-5, 1998.

Wendelberger, Joanne R., "The Future of Environmental Statistics," LA-UR-97-2996, Invited Panel Discussion, 1997 American Statistical Association Meetings, Anaheim, California, 1997.

Moore, Leslie M. and Wendelberger, Joanne R., "Modeling and Uncertainty Bounds for Dynamic Systems With an Application to Polymer Degradation," LA-UR-97-432, presented at the 1997 Spring Research Conference on Statistics in Industry and Technology held in New Brunswick, New Jersey, June 2-4, 1997.

Wendelberger, Joanne R. and McVittie, Thomas I., "Data Management and Statistical Analysis for Environmental Assessment," invited paper, Interface 95, 27th Symposium on the Interface of Computing Science and Statistics, 1995.

Wendelberger, Joanne R. and Beckman, Richard J., invited discussion of "The Use of Conditional Simulation in Nuclear Waste Site Performance Assessment," by Carol Gotway, Technometrics Session, 1993 American Statistical Association Meetings, San Francisco, California, 1993.

Wendelberger, Joanne, "Errors in Controlled Experimental Variables," invited presentation, American Statistical Association, Albuquerque Chapter Meeting, April 29, 1993.

Student Mentoring and Collaboration

Jeannette Figg, UC Santa Barbara, 2008-present. As an undergraduate student intern at LANL, Jeannette learned statistical computing and data analysis skills and contributed to a Cyber Security project.

Brian Weaver, Iowa State University, 2008-present

Brian is a LANL graduate student working on his Masters Degree at Iowa State University. We are collaborating with Prof. William Meeker on planning methods for repeated measures studies.

Jennifer Hockett, New Mexico State University, Iowa State University, 2002-2004

Jennifer completed a bachelor's degree at New Mexico State and a Ph.D. in Statistics at Iowa State. She is now employed at Battelle Memorial Institute.

Wendelberger, Joanne and Hockett, Jennifer, "Development of a Test Plan for Repeated Measures Data," Los Alamos National Laboratory Report, LA-UR-04-7039.

Hockett, Jennifer, "PBX 9501 Sampling Study," Los Alamos National Laboratory Report, LA-UR-03-1112, (Joanne Wendelberger, mentor), 2003.

Hockett, Jennifer, "Comparison of Particle Size Data for PBX 9501," (Joanne Wendelberger, mentor), 2002.

Jerome Bennett, Texas A&M University, 1999. Jerome went into investment banking.

Bennett, Jerome, "Recording Error Analysis," Los Alamos National Laboratory Report, LA-UR-99-6169, (Joanne Wendelberger, mentor), 1999.

Mark Drew, Texas A&M University, 1999. Mark returned to Texas A&M to pursue a masters degree in computer science.

Drew, Mark, "Implementation and Evaluation of Two Statistical Tolerance Bounds," LA-UR-99-4134, Los Alamos National Laboratory Student Poster Presentation, (Joanne Wendelberger, mentor), 1999.

Nancy Fernandez, University of New Mexico, 1994-1997. Nancy earned a Bachelor's degree and a Masters Degree in Statistics at the University of New Mexico and received several offers of admission and financial support for continued graduate study.

Wendelberger, Joanne R., Fernandez, Nancy J., and Hemphill, GERALYN M., "A Guide to Tolerance Intervals," Los Alamos National Laboratory Report, LA-UR-97-1897, 1997.

Community Involvement

- Little Forest Playschool, Los Alamos, New Mexico, Board of Directors (1993-1996). Served 3 years, including terms as president and vice-president, for preschool and childcare cooperative serving over 100 families. Participated in hiring, staff evaluations, personnel matters, financial management, fundraising, renovation planning, lease negotiation, and compliance with state health and safety regulations and federal ADA requirements. Responsibilities included decision-making, policy development, hiring, personnel matters, financial management, fund-raising, lease negotiation, and regulation compliance.
- Barranca Mesa Elementary, Los Alamos, New Mexico, School Volunteer (1993-present). Have assisted with classroom instruction and special activities, served on Search Committee for new principal.
- Girl Scouts of America, Co-Leader/Volunteer (1993-present). Provide adult leadership and coordinate product sales.
- Los Alamos School of Gymnastics, Board of Directors, Treasurer (1999-2003).
- Los Alamos Youth Soccer League (2000-2007). Have served as Board of Directors Advanced Teams and Special Events Coordinator, Coach, Assistant Coach/Manager, Age Group Coordinator, Recreational Festival Committee Volunteer.
- Los Alamos Phi Beta Kappa (2004-2005, 2006-present). Member of Board of Directors, high school scholarship committee.