

Machelle D. Wilson

The University of Georgia
Savannah River Ecology Lab
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Education:

Ph.D. in Ecology, September 2001, University of California, Davis
M.S. in Statistics, December 1999, University of California, Davis
M.S. in Ecology, September 1997, University of California, Davis
BA in Humanities, December 1980, Brigham Young University

Work Experience:

Assistant Professor, October 2001 to present
Savannah River Ecology Lab

Developing a research program in Ecological Statistics. Providing statistical support (consultation and collaboration) to other research faculty and graduate students at SREL and University of Georgia. Working with graduate students as advisor and dissertation/thesis committee member.

Research Assistant (Dissertation Topic) July 2000 – September 2001

Center for Spatial Technologies and Remote Sensing

Comparing the use of support vector (statistical) learning machines to partial least squares dimension reduction in conjunction with logistic discrimination in the classification of leaf-level hyperspectral data for detection of metal or petroleum stress in plants. Comparison of various step-wise multiple regressions to partial least squares regression for prediction of metal and petroleum toxicity in plants using leaf-level hyperspectral data. Testing of above classification and calibration techniques on simulated canopy-level hyperspectral data.

Research Assistant, January 1997 - July 2000

Center for Image Processing and Integrated Computing.

Testing and validating a statistical model containing both multiplicative and additive error terms for use in trace contaminant data and environmental monitoring. Developing Goodness-of-Fit statistics to assess appropriateness of the model, ascertain efficacy in the numerical algorithms, and detect poor experimental design. Estimate the distribution of the detection decision and goodness-of-fit statistics and parameter estimates using the parametric bootstrap.

Teaching Assistant, various quarters during graduate studies

Introductory statistics, introductory biostatistics, soil microbiology, entomology.

Research Assistant, Sept 1996- Dec 1997

Institute for Transportation Studies.

Fitting a model in S+ using data from diverse auto-emission studies to predict emissions based on several fuel parameters.

Intern, Summers 1996 & 1997

Pacific Gas and Electric Company.

Deriving variances for estimates from a conditional demand regression model from a large survey data set, using SAS. Fitting a model in SAS using daily metered residential gas data and climate data from local weather stations to predict gas consumption based on weather variables.

Research Assistant, Sep 1995 - Sept 1996

Mycorrhizal Ecology Lab.

Assisting in building a national data-base on plant, soil and climate variables for use by plant ecologists.

Research Assistant, Apr 1993 - Sep 1995

Mycorrhizal Ecology Lab.

Performing various assays and lab analyses on mycorrhizal spores, plant response to infection, changes in soil.

Chemist, 1992-1993

Central Contra Costa Sanitary District.

Performing bacteriological/chemical analyses and Quality Assurance/Quality Control assays of standard effluent and waste water from the U.V. Disinfection Experiment. Performing statistical analyses of experimental results and laboratory analyses.

Staff Research Assistant, 1990-1991

University of Michigan Medical School, Molecular Pathology Lab.

Designing, planning and performing experiments and assays using the polymerase chain reaction. Analyzing experimental results and assisting in preparation of manuscripts for publication as co-author.

Publications

Apatite and Phillipsite as Sequestering Agents for Metals and Radionuclides.

Journal of Environmental Quality, In Press.

A. S. Knox,* D. I. Kaplan, D. C. Adriano, T. G. Hinton, and M. D. Wilson.

A Simplified Method for the Detection of Cytomegalovirus by Polymerase Chain Reaction from Histologic Sections of Small Biopsies.

MODERN PATHOLOGY, 1992. Vol. 5, number 4, page 449.

Frank, T.S., Wilson, M.D., DelBuono, E.A.

Granulomatous Endometritis associated with Histologically Occult CMV in a Healthy Patient.

AMERICAN JOURNAL OF SURGICAL PATHOLOGY, 1992. Vol. 16, number 7, page 716.

Frank, T.S., Himebaugh, K.S., Wilson, M.D.

Loss of Heterozygosity of P53 Tumor Suppressor Gene in Ovarian Carcinoma.

MODERN PATHOLOGY, 1992. Vol. 5, number 1, page 648.

Haefner, H., Roberts, J.A., Wilson, M.D., Hubbell, G., Frank, T.S.

Posttransplant Minimicroabscess Disease (PTMMD).

MODERN PATHOLOGY, 1992. Vol. 5, number 1, page 96A

DelBuono, E.A., Frank, T.S., Wilson, M.D., Appleman, H.D.

Diagnosis of Cytomegalovirus Infection in Liver Transplant Patients: role of polymerase chain reaction.

MODERN PATHOLOGY, 1992. Vol. 5, number 1, page 96A.

DelBuono, E.A., Wilson, M.D., Frank, T.S.

Submitted

Modeling Uncertainty in Analytical Measurements for Analysis of Bioavailability.

Accepted with minor revisions, October, 2002.

D.M. Rocke, B. P. Durbin, M.D. Wilson, H.D. Kahn.

Application to Environmental Monitoring of a Two-Component Model for Chemical Analytical Error.

Wilson, Machel D.; Rocke, David M.; Kahn, Henry; Durbin, Blythe P.

Submitted, August, 2001; resubmitted December 2002

Comparison of Support Vector Classification to Partial Least Squares Dimension Reduction with Logistic Discrimination of Hyperspectral Data.

Wilson, M.D.; Ustin, Susan L., Rocke, David M.

Submitted December, 2002

Comparative Bias Associated with Various Estimates of Dose to Maximally Exposed Individuals

Wilson, M.D., Hinton, T.G.

Submitted December, 2002

Time Series Analysis of Arctic Whale Baleen Element Concentrations.

Q. Shao, M.D. Wilson, C. Romanek

Submitted December, 2002

The Maximally Exposed Individual—Comparison of Maximum Likelihood Estimation of High Quantiles to The Extreme Value Estimate.

M.D. Wilson, B. McCormick, T. Hinton.

Submitted December, 2002

In Progress

Calibration Regressions of Hyperspectral Data for Prediction of Toxic Stress in Plants.

Wilson, M.D.; Rocke, D.M.; Ustin, S.L.

In progress.

Modeling Spectral Response to Metal and Petroleum Stress in Plants.

Zarco-Tejado, Pablo; Wilson, M.D.; Ustin, Susan L.

In progress.

Modeling Uncertainty of Dose Estimates at Very Low Levels,

M.D. Wilson, Duncan Jackson.

Proceedings from Conference Presentations

The Maximally Exposed Individual—Estimating Bias in Various Sample Statistics,

International Conference on RadioActivity in the Environment, Monaco, September 2002

Classification of Toxicity Using HyperSpectral Data—Support Vector Machines and Partial Least Squares, SPIE's 9th Annual International Symposium on Remote Sensing Crete, September 2002.

The Maximally Exposed Individual—Bias in Extreme Value Estimation,

International Workshop on Radioecology of the Chernobyl Zone, Slavutyich, Ukraine, September 2002.

The Statistics of Extreme Values—Estimating the Dose to the Maximally Exposed Individual,

International Conference on RadioEcology, Darwin, Australia, July 2002,

Goodness-of-Fit Statistics for the Two-Component Error Model.

New Researchers Conference of the American Statistical Association,

Baltimore, July 1999.

Invited Presentations

Does ALARA have any meaning at very low dose levels – a consideration of statistical uncertainty

40th Anniversary Scientific Meeting and AGM: ALARP: principles and practices, Society for Radiological Protection Oxford, England, April 2003

References

Available upon request.