

Steven J. Schwager

Department of Biological Statistics and Computational Biology
and
Department of Statistical Science
Cornell University

Contact Information

Department of Biological Statistics and Computational Biology
1194 Comstock Hall
Cornell University
Ithaca, New York 14853
Phone: 607-255-1644, 607-255-5488
Email: steven [dot] schwager [at] cornell [dot] edu

Education

Ph.D.	Statistics	1979	Yale University
M.Phil.	Statistics	1973	Yale University
M.A.	Statistics	1972	Yale University
M.A.	Mathematics	1968	Columbia University
A.B.	Mathematics	1967	Dartmouth College

Teaching Positions

Associate Professor	Cornell University, Ithaca, NY	1985-present
Visiting Associate Professor	Temple University, Philadelphia, PA	1986-1987
Assistant Professor	Cornell University, Ithaca, NY	1978-1985
Instructor	Eastern Connecticut State College, Willimantic, CT	1969-1971
Instructor	Dillard University, New Orleans, LA	1968-1969

Research Interests

Ecological statistics, epidemiology, experiment design, modeling, multivariate analysis, sampling design, statistical computing, statistical data analysis

Courses Taught

BTRY 4100 (410), Multivariate Analysis
BTRY 3010 (301), Biological Statistics I
BTRY 4080 (408), Theory of Probability
BTRY 4090 (409), Theory of Statistics
BTRY 4950 (495) & BTRY 7950 (795), Statistical Consulting
BTRY 3100 (310), Statistical Sampling
BTRY 6040 (604), Statistical Methods IV: Applied Design
BTRY 6030 (603), Statistical Methods III: Categorical Data
BTRY 6020 (602), Statistical Methods II

Refereed Publications

1. Detection of Multivariate Normal Outliers. (1982) *Ann. Statist.* 10:943-954. (with B.H. Margolin)
2. Run Probabilities in Sequences of Markov-Dependent Trials. (1983) *Journal of the American Statistical Association* 78:168-175.

3. Distribution, Abundance and a Probability Model for Larval *Culicoides Variipennis* on Dairy Farms in New York State. (1983) *Environmental Entomology* 12:768-773. (with E.T. Schmidtman, B.A. Mullens, and S. Spear)
4. Nonisomorphic Complete Sets of Orthogonal F-Squares and Hadamard Matrices. (1984) *Communications in Statistics - Theory and Methods A* 13:1391-1406. (with W.T. Federer and B.L. Raktoe)
5. Embedding Cyclic Latin Squares of Order 2^n in a Complete Set of Orthogonal F-Squares. (1984) *Journal of Statistical Planning and Inference* 10:207-218. (with W.T. Federer and J.P. Mandeli)
6. Bonferroni Sometimes Loses. (1984) *The American Statistician* 38:192-197.
7. Reply to Letter to the Editor by Worsley. (1985) *The American Statistician* 39:236.
8. Towards a Practical Warning System for Fire Blight Blossom Infection. (1984) *Acta Horticulturae* 151:23-36. (with S.V. Beer, J.L. Norelli, H.S. Aldwinckle, and T.J. Burr)
9. Mean Slippage Problems. (1985) *Encyclopedia of Statistical Sciences*, Vol. 5, 372-375. John Wiley and Sons, Inc., New York.
10. Multivariate Skewness and Kurtosis. (1985) *Encyclopedia of Statistical Sciences*, Vol. 6, 122-125. John Wiley and Sons, Inc., New York.
11. Characteristics for Distinguishing Among Balanced Incomplete Block Designs with Repeated Blocks. (1986) *Journal of Statistical Planning and Inference* 13:151-163. (with D. Raghavarao and W.T. Federer)
12. Applying Statistical Graphics to Multivariate Data. (1986) *Proceedings of the Seventh Annual Conference and Exposition of the National Computer Graphics Association*, Vol. 3, 704-712.
13. A Comparison of Association Indices. (1987) *Animal Behaviour* 35:1454-1469. (with S.J. Cairns)
14. Single Locus Segregation in the Tetraploid Treefrog *Hyla Versicolor* With an Analysis of Expected Progeny Ratios in Tetraploid Organisms. (1987) *Genetics* 116:299-311. (with J.E. Marsden and B. May)
15. An Information Interpretation of Financial Analyst Superiority in Forecasting Earnings. (1987) *Journal of Accounting Research* 25:49-67. (with L.D. Brown and G.D. Richardson)
16. Prevalence of Patent *Baylisascaris procyonis* Infection in Raccoons (*Procyon lotor*) in Ithaca, New York. (1989) *Journal of Parasitology* 75(6):870-874. (with J.D. Kidder, S.E. Wade, and M.E. Richmond)
17. Statistical and Mathematical Approaches in HIV/AIDS Modeling: A Review. (1989) In *Mathematical and Statistical Approaches to AIDS Epidemiology*. C. Castillo-Chavez (ed.). Lecture Notes in Biomathematics 83, 2-35. (with C. Castillo-Chavez and H. Hethcote)
18. Mapping of Ripening-Related or -Specific cDNA Clones of Tomato (*Lycopersicon esculentum*). (1990) *Theoretical and Applied Genetics* 79:489-496. (with S.M. Kinzer and M.A. Mutschler)
19. Sorption Equilibria of Vapor Phase Organic Pollutants on Unsaturated Soils and Soil Minerals. (1990) Environics Division, Air Force Engineering & Services Center. (with L.W. Lion, S.K. Ong, S.R. Lindner, J.L. Swanger, and T.B. Culver)
20. A Statistical Method for the Accurate and Rapid Sampling of Urban Street Tree Populations. (1992) *Journal of Arboriculture* 18:171-183. (with R. Jaenson, N. Bassuk, and D. Headley)

21. The Effect of Linkage on Sample Size Determination for Multiple Trait Selection. (1993) *Theoretical and Applied Genetics* 86:964-974. (with W.T. Federer, M.A. Mutschler, and B.T. Scully)
22. Determining the Minimum Sample Size Required to Obtain Sufficient Progeny with a Desired Genotype at Two Quantitative Trait Loci. (1993) *Theoretical and Applied Genetics* 87:136-144. (with S.-F. Hsu Schmitz and E.J. Pollak)
23. Effects of Maternal Nutritional Status and Maternal Energy Supplementation on Length of Postpartum Amenorrhea Among Guatemalan Women. (1993) *Amer. Journal of Clinical Nutrition* 58(5):636-642. (with K.M. Kurz, J-P. Habicht, and K.M. Rasmussen)
24. A Test of Additional Accuracy for Selecting Groups of Allocation Variables. (1994) *Technometrics* 36:202-211. (with J.C. Evans)
25. Perceptual Dimensions That Influence Consumers' Choices of Milk Type for Beverage Use. (1995) *Agribusiness* 11:263-272. (with H. Miles and J.E. Lenz)
26. Thiabendazole Resistance in Fusarium Species Associated with Dry Rot of Potato. (1996) *Phytopathology* 86:378-384. (with L.E. Hanson and R. Loria)
27. Survey of Apple Farms in New York State; Report for the New York State Department of Labor. (1996) Cornell University, *CISER Survey Research Facility*. (with J. Maestro-Scherer and T.R. Maloney)
28. Predicting Rainfall Erosivity in Honduras. (1997) *Soil Science Society of American Journal* 61:273-279. (with E. Mikhailova, R.B. Bryant, and S.D. Smith)
29. Evaluation of Discriminant Analysis in Identification of Low- and High-Water Use Kentucky Bluegrass Cultivars. (1998) *Crop Science* 36:152-157. (with J.S. Ebdon and A.M. Petrovic)
30. Interaction Between Milk Yield of Holstein Cows in Mexico and the United States. (1999) *Journal of Dairy Science* 82(10):2218-2223. (with E.G. Cienfuegos-Rivas, P.A. Oltenacu, R.W. Blake, H. Castillo-Juarez, and F.J. Ruiz)
31. Social Acceptability of Wildlife Management Actions in Suburban Areas: 3 Cases from New York. (1999) *Wildlife Society Bulletin* 27:152-159. (with C.A. Loker and D.J. Decker)
32. Cultivation Effects on Soil Organic Carbon and Total Nitrogen Contents in the Russian Chernozem. (2000) *Soil Science Society of America Journal* 64:738-745. (with E.A. Mikhailova, R.B. Bryant, I. Vassanov, and C. Post)
33. Breastfeeding Behavior and Infant Survival with Emphasis on Reserve Causation Bias: Some Evidence from Nigeria. (2000) *Social Biology* 47(1-2):94-113. (with C. Ahiadeke and D.T. Gurak)
34. Use of Adaptive Cluster Sampling for Hydroacoustic Surveys. (2002) *ICES Journal of Marine Science* 59(6):1314-1325. (with M.E. Connors)
35. Estimating Variability in Soil Organic Carbon Storage Using the Method of Statistical Differentials. (2002) *Soil Science* 167(3):194-200. (with E.A. Mikhailova)
36. Critical Response Time (Time Available to Implement Effective Measures for Epidemic Control): Model Building and Evaluation. (2003) *Canadian Journal of Veterinary Research* 67(4):307-311. (with A.L. Rivas, S.E. Tennenbaum, J.P. Aparicio, A.L. Hoogesteijn, H.O. Mohammed, and C. Castillo-Chavez)
37. Global Assessment of Organic Contaminants in Farmed Salmon. (2004) *Science* 2004 January 9, 303(5655):226-229. (with R.A. Hites, J.A. Foran, D.O. Carpenter, M.C. Hamilton, and B.A. Knuth)

38. Response to Letters to the Editor by Rembold, Tuomisto et al, Lund et al, Weaver. (2004) *Science* 2004 July 23, 305(5683):476-478. (with R.A. Hites, J.A. Foran, D.O. Carpenter, M.C. Hamilton, and B.A. Knuth)
39. A Survey of Metals in Tissues of Farmed Atlantic and Wild Pacific Salmon. (2004) *Environmental Toxicology and Chemistry* 23(9):2108-2110. (with J.A. Foran, R.A. Hites, D.O. Carpenter, M.C. Hamilton, and A. Mathews-Amos)
40. Global Assessment of Polybrominated Diphenyl Ethers in Farmed and Wild Salmon. (2004) *Environmental Science & Technology* 38(19):4945-4949. (with R.A. Hites, J.A. Foran, B.A. Knuth, M.C. Hamilton, and D.O. Carpenter)
41. Response to Letter to the Editor by Hardy. (2005) *Environmental Science & Technology* 39(1):379-380. (with R.A. Hites, J.A. Foran, B.A. Knuth, M.C. Hamilton, and D.O. Carpenter)
42. Early and Cost-Effective Identification of High Risk/Priority Control Areas in Foot-and-Mouth Disease Epidemics. (2004) *Journal of Veterinary Medicine Series B* 51(6):263-271. (with A.L. Rivas, S. Smith, and A. Magri)
43. Risk-Based Consumption Advice for Farmed Atlantic and Wild Pacific Salmon Contaminated with Dioxins and Dioxin-Like Compounds. (2005) *Environmental Health Perspectives* 113(5):552-556. (with J.A. Foran, D.O. Carpenter, M.C. Hamilton, and B.A. Knuth)
44. Response to Letter to the Editor by Middaugh et al. (2005) *Environmental Health Perspectives* 113(10):A656-657. (with J.A. Foran, D.O. Carpenter, M.C. Hamilton, and B.A. Knuth)
45. Lipid composition and contaminants in farmed and wild salmon. (2005) *Environmental Science & Technology* 39(22):8622-8629. (with M.C. Hamilton, R.A. Hites, J.A. Foran, B.A. Knuth, and D.O. Carpenter)
46. Quantitative Analysis of the Benefits and Risks of Consuming Farmed and Wild Salmon. (2005) *Journal of Nutrition* 135(11):2639-2643. (with J.A. Foran, D.H. Good, D.O. Carpenter, M.C. Hamilton, and B.A. Knuth)
47. Consumption Advisories for Salmon Based on Risk of Cancer and Non-Cancer Health Effects. (2006) *Environmental Research* 101(2):263-274. (with X. Huang, R.A. Hites, J.A. Foran, M.C. Hamilton, B.A. Knuth, and D.O. Carpenter)
48. Letter to the Editor: Risks and Benefits of Seafood Consumption. (2006) *American Journal of Preventive Medicine* 30(5):438-439. (with J.A. Foran, D.O. Carpenter, D.H. Good, M.C. Hamilton, R.A. Hites, and B.A. Knuth)
49. Human-mediated Foot-and-mouth Disease Epidemic Dispersal: Disease and Vector Clusters. (2006) *Journal of Veterinary Medicine Series B* 53(1):1-10. (with A.L. Rivas, B. Kunsberg, G. Chowell, S.D. Smith, and J.M. Hyman)
50. Effect of Early Postnatal Body Weight on Femoral Head Ossification Onset and Hip Osteoarthritis in a Canine Model of Developmental Dysplasia of the Hip. (2006) *Pediatric Research* 60(5):549-554. (with W.S.V. Berg-Foels, R.J. Todhunter, and A.P. Reeves)
51. Multifactorial Relationships Between Intramammary Invasion by *Staphylococcus aureus* and Bovine Leukocyte Markers. (2007) *Canadian Journal of Veterinary Research* 71(2):135-144. (with A.L. Rivas, R.N. Gonzalez, F.W. Quimby, and K.L. Anderson)
52. Spatial Distribution of Acaricide Profiles (*Boophilus microplus* Strains Susceptible or Resistant to Acaricides) in Southeastern Mexico. (2007) *Veterinary Parasitology* 146:158-169. (with R.I. Rodríguez-Vivas, A.L. Rivas, G. Chowell, S.H. Fragoso, C.R. Rosario, Z. García, S.D. Smith, and J.J. Williams)

53. Receiver Operating Characteristic-Based Assessment of a Serological Test Used to Detect Johne's Disease in Israeli Dairy Herds. (2008) *Canadian Journal of Veterinary Research* 72:18-26. (with M. Chaffer, A.L. Rivas, D. Elad, O. Koren, S. Garazi, and G. Chowell)
54. Robust Hypothesis Tests for Independence in Community Assembly. (2008) *Journal of Mathematical Biology* 57:537-555. (with J. Ladau)
55. Optimization of Epidemiologic Interventions: Evaluation of Spatial and Non-Spatial Methods That Identify Johne's Disease-Infected Subpopulations Targeted for Intervention. (2008) *Israel Journal of Veterinary Medicine* 63:59-71. (with A.L. Rivas, M. Chaffer, G. Chowell, D. Elad, O. Koren, and S.D. Smith)
56. Proof of Concept of a Method That Assesses the Spread of Microbial Infections with Spatially Explicit and Non-spatially Explicit Data. (2008) *International Journal of Health Geographics* 7:58. (with A.L. Rivas, K.L. Anderson, R. Lyman, and S.D. Smith)
57. Improved Cell Sensitivity and Longevity in a Rapid Impedance-Based Toxicity Sensor. (2009) *Journal of Applied Toxicology*, www.interscience.wiley.com, DOI 10.1002/jat.1421. (with T.M. Curtis, L. Romeo, J. Tabb, M.W. Widder, and W.H. van der Schalie)
58. A Portable Cell-based Impedance Sensor for Toxicity Testing of Drinking Water. (2009) *Lab on a Chip*, DOI: 10.1039/b901314h. (with T.M. Curtis, M.W. Widder, L.M. Brennan, W.H. van der Schalie, J. Fey, and N. Salazar)
59. Acoustic Estimation of Wildlife Abundance: Methodology for Vocal Mammals in Forested Habitats. (2009) To appear in *African Journal of Ecology*. (with M.E. Thompson, K.B. Payne, and A.K. Turkalo)
60. Heard But Not Seen: An Acoustic Survey of the African Forest Elephant Population at Kakum Conservation Area, Ghana. (2009) To appear in *African Journal of Ecology*. (with M.E. Thompson and K.B. Payne)
61. Lessons from Nigeria: The Role of Roads in the Geo-Temporal Progression of Avian Influenza (H5N1) Virus. (2009) To appear in *Epidemiology and Infection*. (with A.L. Rivas, G. Chowell, F.O. Fasina, A.L. Hoogesteijn, S.D. Smith, S.P.R. Bisschop, K.L. Anderson, and J.M. Hyman)

Articles Tentatively Accepted, Submitted, and In Preparation

1. Mathematical Philology: Entropy Information in Refining the Reconstruction of Classical Texts, and Anticipation of Information Science by Early Philologists. (2009) Tentatively accepted for publication, *PLoS ONE*. (with J.L. Cisne and R.M. Ziomkowski)
2. Non-linear Profiles of Host-Microbial-Temporal Interactions – Identification of Disease Stages. (2009) Submitted for publication. (with A.L. Rivas, K.L. Anderson, G. Leitner, D. Schwarz, R. Piccinini, A.L. Hoogesteijn, M. Chaffer, O. Krifucks, C-P. Czerny, W. Wolter, R.K. Pilla, R.R. Rodriguez, C.P. Linn, D. Asion, F.W. Quimby, and J.M. Hyman)
3. Four Fundamental Processes of Community Assembly. (2008) In preparation. (with J. Ladau)
4. Censored Geometric Regression with Application to Human Subfertility. (2008) In preparation. (with D. Zelterman)
5. Subluxation of the Developing Femoral Head Alters Bone Mineral Density Patterns in a Canine Model of Hip Dysplasia. (2008) In preparation. (with W.V. Berg-Foels, R.J. Todhunter, and A.P. Reeves)
6. Effect of Subluxation on Femoral Head Shape Development in a Canine Model of Hip Dysplasia. (2008) In preparation. (with W.V. Berg-Foels, R.J. Todhunter, and A.P. Reeves)

Professional Society Membership

- American Statistical Association

Consulting Experience

- Statistical Consultant, 1975 - present
- Statistical Consultant, Cornell Statistical Consulting Unit (previously Biological Statistics and Computational Biology / Department of Biometrics / Biometrics Unit Consulting Service), Cornell University, 1978 - present
- Member of Statistics and Design Team for the U.S. Environmental Protection Agency's EMAP (Environmental Monitoring and Assessment Program), 1990 - 1995
- Mathematical Statistician, Biometry Branch, National Institute of Environmental Health Sciences (Research Triangle Park, NC), 1979
- Statistical Consultant, User Services, Yale Computer Center (New Haven, CT), 1974 - 1976

Graduate Theses Directed

- Ladau, Joshua. "Robust Statistical Tests for Detecting the Effects of Interspecific Competition on Ecological Communities." Ph.D., 2006.
- Conners, M. Elizabeth. "Use of Adaptive Cluster Sampling Designs for Hydroacoustic Fish Surveys." M.S., 1999.
- Li, Yanfen. "Embedding a Cyclic Latin Square of Prime Power Order in a Complete Set of Orthogonal F-Squares." M.S., 1994.
- Chandra, Pinky. "Response Surface Estimation Under Sampling with Systematic Pattern." M.S., 1993.
- Shyu, Shwu-Fang. "Minimum Progeny Sample Size Determination for a Specified Progeny Two-Locus Genotype." M.S., 1992.
- Zinn, Jack H. "Estimation for the Dirichlet Distribution." M.S., 1990.
- Matute Flores, Jorge A. "Unbiased Estimation of the Reciprocal of Population Size in a $(k+1)$ Sample Mark-Recapture Experiment on a Closed Population." M.S., 1988; co-directed with D.S. Robson.
- Lichtenstein, Carolyn. "Discriminant Analysis with Uncertain Labels." Ph.D., 1985.
- Nolan, Patricia E. "Nonparametric Mean Slippage: A Simulation Study." M.S., 1984.
- Dixon, Philip M. "Parameter Estimation in deWit Replacement Series: the Choice of Error Structure." M.S., 1984.
- Evans, John C. "Stagewise Selection and Classification of Multivariate Repeated Measurements." Ph.D., 1983.
- Simon, Marcus T. "Goodness-of-Fit Tests for Bivariate Normality: A Simulation Study." M.S., 1980.

Departmental and Professional Service

- Director of Undergraduate Studies, Biometry and Statistics, 1991 to 2009
- Director of Graduate Studies, Field of Biometry, 1996 to 2000
- Departmental Representative to CALS and University Faculty Senate, 1997 to 2000

- Chair of CALS Quantitative Literacy Task Force, 1996 to 1999
- Chair of CALS College Curriculum Committee, 1995 to 1997
- Reviewer for *Annals of Statistics*, *Journal of the American Statistical Association*, *The American Statistician*, *Journal of Statistical Planning and Inference*, *Biometrics*, *Scandinavian Journal of Statistics*, *Nature*, *Ecology*, and other professional journals
- Associate Editor for *The American Statistician*, 1993 to 1996
- Editorial Board Member for *Communications in Statistics*, 1985 to 1992
- Judge for ASQC Wilcoxon and Youden Prizes, 1978 to 1990
- Review panel member for National Science Foundation, Undergraduate Course and Curriculum Development Program, July 1993 and July 1995
- Book review of *Modern Multivariate Statistical Analysis: A Graduate Course and Handbook* by M. Siotani, T. Hayakawa, and Y. Fujikoshi. (1988) *Journal of the American Statistical Association* 83, 274.
- Book review of *Probability Distributions: An Introduction to Probability Theory with Applications* by Chris P. Tsokos. (1975) *Journal of the American Statistical Association* 70, 491.