

**CURRICULUM VITAE**  
**R. Jeanette O'Hara Hines**

**Qualifications:**

Ph.D.	University of Waterloo	1990
M.M.	University of Waterloo	1972
M.A.	Queen's University	1971
B.A.	University of New Brunswick (distinguished)	1968

**Experience:**

2011	Retired
1998-2011	Director of the Statistical Consulting Center Department of Statistics and Actuarial Science University of Waterloo
1997-2011	Tenured Associate Professor Department of Statistics and Actuarial Science University of Waterloo
1993-2011	Adjunct Graduate Faculty Department of Mathematics and Statistics University of Guelph
1993-2010	Faculty Cross Appointment Department of Biology University of Waterloo
1993-1997	Tenure-track Assistant Professor Department of Statistics and Actuarial Science University of Waterloo
1990-1993	Research Assistant Professor Department of Statistics and Actuarial Science University of Waterloo
1985-1989	Statistical Consultant and Lecturer Department of Statistics and Actuarial Science University of Waterloo

1985                    Statistical Consultant  
Syntex, Palo Alto, CA

1985                    Statistical Consultant  
Computer Centre  
University of Santa Cruz, Santa Cruz, CA

1984-1985            Visitor (Research Associate)  
Department of Mathematics  
University of Santa Cruz, Santa Cruz, CA

1972-1984            Statistical Consultant and Lecturer  
Departments of Psychology, Zoology and Mathematics  
and Statistics  
University of Guelph

## **RESEARCH PROFILE**

### **Research Interests:**

- Designs, models and diagnostics for grouped longitudinal toxicological mortality data
- Diagnostics for and overdispersion in generalized linear models
- Generalized estimating equations
- Analysis of clustered polytomous data with individual and group covariates
- Analysis of retrospectively sampled nested polytomous data with individual and cluster covariates
- Model-based covariance structures for multivariate estimating equations
- Models for bivariate (discrete and categorical combined) responses with non-random droupouts
- Analysis of longitudinal categorical data with MAR drop-outs using GEE
- Improving tests for homogeneity of variance
- Analysis of correlated biotelemtric data
- Home-range estimation using kernel density estimators
- Indices for covariance mis-specification in longitudinal data analysis

### **Supervisory Experience:**

Co-supervised one Ph.D. student in statistics at the University of Guelph whose work involved robust estimation in sampling.

Supervised eleven Master's students in statistics at the University of Waterloo who examined indices for covariance mis-specification in longitudinal data, various methods for analyzing longitudinal response data, effects of ascertainment sampling in segregation analysis, summarized the analysis of non-detects in toxicological work, examined methods of analyses appropriate to environmental monitoring, survey statistical genetics methods used in twin studies, considered parametric and non-parametric classification techniques for use on bank customer data, analyzed longitudinal categorical responses associated with data on nests of young smallmouth bass.

Co-supervised five Master's students in statistics, one at the University of Waterloo and four at the University of Guelph, who developed a Hausdorff calculator to measure the 'wiggleness' of correlated location data, surveyed sequential sampling plans used to monitor insect infestation levels in forests, examined existing techniques for testing home-range biotelemetric data, investigated meta-analysis on clinical trials examining heart disease and compared discriminant analysis and classification techniques for identifying brain injured patients.

Co-supervised a Ph.D. in Biology at the University of Waterloo who used neural nets and statistical clustering procedures to group dive profiles of marine mammals.

Co-supervised a Master's in Biology at the University of Waterloo who used spectral and cross-correlation analysis to analyze dive depth and heart rate data of marine mammals.

Directed the consulting efforts of many graduate students in the Department's statistical consulting apprenticeship program.

Director of the Statistical Consulting Unit in the Department of Statistics and Actuarial Science, supervising one part-time statistical consultant and several RA's.

## **PUBLICATIONS**

### **Refereed Chapters in Books:**

O'Hara Hines, R.J. and W.G.S. Hines. 1996. Allowing for Variable Natural Mortality in the Analysis of Grouped Longitudinal Mortality Data. Statistics in Toxicology (edited by Dr. B.J.T. Morgan), a volume in memory of David Williams, in the Royal Statistical Society Lecture Note Series. pp. 101-126

## Publications in Refereed Journals:

- O'Hara Hines, R.J. and W.G.S. Hines. 2011. Improvements to Indices for Covariance Mis-specification in Longitudinal Data Analysis with no Missing Responses and with MAR Dropouts. Under revision. *Computational Statistics & Data Analysis*.
- O'Hara Hines, R.J. and W.G.S. Hines. 2010. Indices for covariance mis-specification in longitudinal data analysis with no missing responses and with MAR dropouts. *Computational Statistics & Data Analysis*, 54, 806-815.
- O'Hara Hines, R.J. and W.G.S. Hines. 2007. Covariance miss-specification and the local influence approach in sensitivity analyses of longitudinal data with drop-outs. *Computational Statistics & Data Analysis*, 51, 5537-5546.
- O'Hara Hines, R.J. and W.G.S. Hines. 2006. Letter to the editor concerning 'An index of local sensitivity to nonignorable drop-out in longitudinal modelling by G. Ma, A.B. Troxel, and D.F. Heitjan in *Statistics in Medicine*, 2005, 24:2129-2150'. *Statistics in Medicine*, 25, 3217-3218.
- O'Hara Hines, R.J. and W.G.S. Hines. 2005. An appraisal of methods for the analysis of longitudinal categorical data with MAR drop-outs. *Statistics in Medicine*, 24, 3549-3563.
- Hines, W.G.S., R.J. O'Hara Hines, B.Pond and M.E.Obard. 2005. Allowing for redundancy and environmental effects in estimates of home range utilization distribution. *Environmetrics*, 16, 33-50.
- Hicks, J.L., R.J. O'Hara Hines, J.F. Schreer and M.O. Hammill. 2004. Correlation of depth and heart rate in harbor seal pups. *Canadian Journal of Zoology*, 82, 1147-1156.
- O'Hara Hines, R.J., W.G.S. Hines and B.W. Robinson. 2004. A new statistical test of fitness set data from reciprocal transplant experiments involving intermediate phenotypes. *The American Naturalist*, 163, 97-104.
- Schreer, J.F., K.M. Kovacs and R.J. O'Hara Hines. 2001.

- Comparative Diving Patterns of Pinnipeds and Seabirds. Ecological Monographs. 71, 137-162.
- Hines, W.G.S. and R.J. O'Hara Hines. 2000. Increased Power with a Modified Form of the Levene (Med) Test for Heterogeneity of Variance. Biometrics, 56, 451-454.
- O'Hara Hines, R.J., W.G.S. Hines and T.G. Friesen. 1999. A Comparison of Two Drop-out Weighting Schemes in the Analysis of Clustered Data with Categorical and Continuous Responses. Journal of Agricultural, Biological, and Environmental Statistics, 4, 203-216.
- Schreer, J.F., R.J. O'Hara Hines and K.M. Kovacs. 1998. Classification of Dive Profiles: a Comparison of Statistical Clustering Techniques and Unsupervised Artificial Neural Networks. Journal of Agricultural, Biological, and Environmental Statistics 3, 383-404.
- O'Hara Hines, R.J. 1998. Comparison of Two Covariance Structures in the Analysis of Clustered Polytomous Data Using Generalized Estimating Equations. Biometrics 54, 312-316.
- O'Hara Hines, R.J. 1997. Analysis of Clustered Polytomous Data Using Generalized Estimating Equations and Working Covariance Structures. Biometrics 53. 1552-1556.
- O'Hara Hines, R.J. 1997. An Application of Response-based Sampling in the Analysis of a Very Large Clustered Data Set. Journal of Statistical Computation and Simulation. 59, 63-81.
- O'Hara Hines, R.J. 1997. A Comparison of Score Tests for Overdispersion in Generalized Linear Models. Journal of Statistical Computation and Simulation. 58, 323-342.
- O'Hara Hines, R.J. 1997. Fitting Generalized Linear Models to Retrospectively Sampled Clusters with Categorical Responses. The Canadian Journal of Statistics, 25, 159-174.
- O'Hara Hines, R.J. and W.G.S. Hines. 1996. Exploring Cook's Statistic Graphically. The American Statistician, 49, 389-394
- O'Hara Hines, R.J. and W.G.S. Hines. 1994. A Comment on Selecting Sample Sizes and Discrete Observation Times for Longitudinal Mortality Studies. Environmetrics 5: pp. 83-85.
- O'Hara Hines, R.J. and J. F. Lawless. 1993. Modelling

- Overdispersion in Toxicological Mortality Data Grouped Over Time. *Biometrics* 49: pp. 107-121.
- O'Hara Hines, R.J. and E. M. Carter. 1993. Improved Added Variable and Partial Residual Plots for the Detection of Influential Observations in Generalized Linear Models. *Applied Statistics* 42: pp. 3-20.
- O'Hara Hines, R.J. and W.G.S. Hines. 1992. On Selecting Sample Sizes and Discrete Observation Times for Longitudinal Mortality Studies. *Environmetrics* 3: pp. 261-279.
- O'Hara Hines, R.J., J. F. Lawless and E. M. Carter. 1992. Diagnostics for a Multinomial Generalized Linear Model, with Applications to Grouped Toxicological Mortality Data. *J. Amer. Statist. Assoc.* 87: pp. 1059-1069.
- O'Hara Hines, R.J. and W.G.S. Hines. 1989. Wandering Quarter Sampling for the Detection of Nonrandomness of Spatial Point Distributions. *Communications in Statistics*. 18(7): pp. 2599-2614.
- Hines, W.G.S. and R.J. O'Hara Hines. 1987. Quick Graphical Power-Law Transformation Selection. *Amer. Statist.* 41: pp. 21-24.
- Hines, W.G.S., R.J. O'Hara Hines, and J.D. Brooke. 1987. A Multivariate Analysis of Cyclic Data, Applied in Modelling Locomotor Forces, *Biol. Cybern.* 56: pp. 1-11.
- Gullet, E.A., D.L. Rowe and R.J. Hines. 1984. Sensorial Assessment of the Eating Quality of Meat. *Can. Inst. Food Sci. Technol. J.* 17: pp. 229-236.
- Gullet, E.A., S.D.M. Jones and R.J. Hines. 1983. Palatability of longissimus dorsi of young and mature dairy cows. *Can. Inst. Food Sci. Technol. J.* 16: 19.
- Westlake, G.F., J.B. Sprague, R.J. Hines and I.T. Brown. 1983. Sublethal effects of treated liquid effluent from a petroleum refinery. III. Avoidance and other locomotor responses of rainbow trout. *Aquatic Toxicology* 4: 235-245.
- Hines, W.G.S. and R.J. O'Hara Hines. 1979. The Eberhardt statistic and the detection of nonrandomness of spatial point distributions. *Biometrika* 66: 73-79.
- Hines, R.J. and J.F. Hurnik. 1977. The number and spacing of

measurements in the estimation of feed consumption. Poultry Science 56: 2101-2102.

**Funding:**

NSERC 5 year operating grant, 2005-2010 \$17,000 p.a.  
"Methods for Analyzing Complex Longitudinal and Clustered Data  
and Biotelemetric Data"

NSERC 4 year operating grant, 2000-2004 \$19,000 p.a.  
"Methods for Analyzing Complex Clustered Data and Biotelemetric  
Data"

NSERC 4 year operating grant, 1996-2000 \$15,400-17,767 p.a.  
"The Analysis of Multivariate Clustered Data"

NSERC 3 year operating grant, 1993-1996 \$11,000 p.a.  
"The Analysis of Messy Multinomial Data"

NSERC 3 year operating grant, 1990-1993 \$12,500 p.a.  
"Models and Diagnostics for Grouped Mortality Data"

Faculty of Math. start-up grant, 1990 \$4000

Participant in department's submissions for NSERC  
Infrastructure Grants for consulting unit,  
1990-1993  
1993-1996

**Organizational Experience:**

2004-2005: organized and participated in a session for the annual Statistical Society of Canada (SSC) meetings in Saskatoon, 2005 titled 'How and how well do we train our future statistical consultants'.

2003-2004: organized and chaired a session for the annual Joint Statistical Meeting in Toronto, 2004 titled 'Women's Health: What About It?'

2002-2003: organized and chaired a session for the annual Statistical Society of Canada (SSC) meetings in Halifax, 2003 titled 'Modern Statistical Methods in Biology'.

1999-2000: helped to design several workshops on survey and questionnaire designs. These workshops are intended for researchers both within and without the university community.

1998-1999: organized a session for the annual Statistical Society of Canada (SSC) meetings in Regina, 1999 titled "Statistical Consulting as a Business: Reports from the Front Line".

1997-1998: gathered data and organized two case studies sessions presented by graduate students at the SSC conference in Sherbrooke, 1998.

1993-1994: organized and chaired a session sponsored by the SSC at the Environmetrics Conference in Hamilton, 1994.

1991: organized and chaired a session on correlated longitudinal data for the WNAR conference in Santa Barbara, CA.

#### **Invited Seminars:**

May 2010, SSC in Quebec: 'An appraisal of methods for the analysis of longitudinal categorical data with MAR drop-outs'.

December 2004, University of Guelph: 'Practical methods for the analysis of longitudinal categorical data with MAR drop-outs'.

August 2002, ASA in New York: 'Home Range Estimation from Correlated Biotelemetric Data, Using Kernel Density Estimation'.

June 2000, SSC in Ottawa: 'Weighting for Drop-outs in the Analysis of Categorical and Continuous Responses Using GEEs'.

April 1999, University of Western Ontario: 'A Comparison of Two Drop-out Weighting Schemes in the Analysis of Clustered Data with Categorical and Continuous Responses'.

June 1997, SSC in Fredericton: 'Introducing Statistics to Biologists'.

August 1994, IBC in Hamilton: 'The Analysis of Very Large Polytomous Clustered Data with Individual and Cluster Covariates'.

June 1993, Waterloo: 'The Analysis of Grouped Longitudinal Mortality Data Allowing for Variable Natural Mortality'.

November 1992, UC Davis: 'Modelling Overdispersion in Toxicological Data Grouped Over Time'.

October 1992, UC San Francisco: 'Modelling Overdispersion in Toxicological Data Grouped Over Time'.

### **Contributed Talks:**

June 1999, SSC in Regina: 'A Comparison of Two Drop-out Weighting Schemes in the Analysis of Clustered Data with Categorical and Continuous Responses'.

July 1996, IBC in Amsterdam: 'An Application of Retrospective Sampling in the Analysis of Very Large Clustered Data Sets'.

June 1996, SSC at Waterloo: 'An Application of Retrospective Sampling in the Analysis of Very Large Clustered Data Sets'.

May 1994, SSC in Banff: 'Techniques for the Analysis of Grouped Longitudinal Mortality Data, Adjusting for Variable Natural Mortality'.

December 1992, IBC in Hamilton, NZ: 'On Selecting Sample Sizes and Discrete Observation Times for Longitudinal Mortality Studies'.

June 1992, SSC in Edmonton: 'On Selecting Sample Sizes and Discrete Observation Times for Longitudinal Mortality Studies'.

June 1991, SSC in Toronto: 'Diagnostics for a Multinomial Generalized Linear Model, with Applications to Grouped Toxicological Mortality Data'.

### **Journals Refereed for:**

Canadian Journal of Statistics, Applied Statistics, the Biometrical Journal, JABES, Journal of Communications in Statistics, the Statistician, Biometrics, Environmental Toxicology and Chemistry, JASA, Environmetrics, Statistics in Medicine and NSERC.

## **TEACHING**

### **Courses Taught:**

- Statistics for Mathematical Students (Undergraduate)
- Statistics for Biologists (Undergraduate)

- Regression Analysis (Graduate and Undergraduate)
- Statistical Consulting (Graduate)
- Applied Statistical Methods (Graduate)  
(experimental design and regression)
- Applied Multivariate Techniques (Graduate)
- Exploratory Data Analysis (Undergraduate)
- Applied Sampling Methods (Undergraduate)
- Experimental Design (Graduate and Undergraduate)

## CONSULTING

### Consulting Interests:

- Methods of analysis for non-normal clustered data, using generalized estimating equations
- Methods of analysis for overdispersed multinomial data, using generalized
- Analysis of longitudinal mortality data, using generalized linear models and graphical and other diagnostics
- Analysis of nested polytomous accident data with individual and group covariates
- Other generalized linear models, including probit and logit analyses
- Other discrete data analysis methods
- Exploratory data analysis
- Analysis of Variance and Covariance, including repeated measures
- Multivariate analysis (ANOVA, Cluster analysis, Discriminant analysis, Factor analysis, Principal Components analysis)
- Regression analysis
- Data diagnostics
- Log-linear models
- Sampling
- Sensory evaluation
- Nonparametric techniques

### Consulting Experience:

<u>Client</u>	<u>Project</u>	<u>Technique</u>
Humansystems	Military study	Providing advice on design

		of factorial experiment
Humansystems	Time management survey	Providing advice on design and analyses of survey
Humansystems	Workboot study	Providing advice on design and analyses of an incomplete block design
C. Portt: Biological Consultant	Study of infill impact on fish populations	Reviewing data collection process and methods of analysis
Cantox	Toxicological studies	Providing advice on statistical analyses: non-detects, ANOVA, regression, clinical trials
Canadian Ministry of Natural Resources	Heavy industry impact on fish populations	ANOVA, logit and log-linear analyses
Diversified Research, Toronto	Food product evaluation	ANOVA, regression and correlation, exploratory data analysis and diagnostics
Syntex, Palo Alto	Evaluation of clinical drug trials data	ANOVA, data diagnostics
J. Carter, Biologist, Univ. of Waterloo	Acid rain effect investigation of zooplankton and ecological records	ANOVA, clustering techniques, correlation analysis
	Heavy industry impact on zooplankton populations	
V. Valli, Pathologist, Univ. of Guelph	Mortality effects of drug dose levels in mice	Probit analysis
Dicky-john,	Comparison of bacteria	Components of

Cornwall	level measurement procedure for milk	variance, bootstrapping, ANOVA, correlation
Diversity/ Wyandott, Toronto	Comparison of bacteria levels in commercial washing machines	Exploratory data analysis, experimental design, nonparametric analyses
Canadian Ministry of Consumer Affairs	Investigation of misleading advertising with J. Liefeld and L. Heslop	Experimental design, ANOVA, logit analyses
International Environmental Consulting, Toronto	Zooplankton data analysis to detect environmental effects in the Ottawa river	Discriminant analysis, multivariate ANOVA
Universities of Waterloo, Guelph	Faculty, student and administration research projects	Those listed in "Consulting Interests" and others as needed

**Computing Procedures and Languages:**

R, SAS, SYSTAT, BMDP, SPSS, SPLUS, APL, FORTRAN, WordPerfect