

DEPARTMENT OF STATISTICS
UNIVERSITY OF SOUTH CAROLINA
COLUMBIA

ANNUAL REPORT OF ACTIVITIES

January - December 2003

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PREFACE

Since 1974 the Statistics Program has provided the University administration an annual report summarizing its activities. The department is currently in its nineteenth academic year of operation, having been formed in July 1985, from the program that had developed within the Mathematics and Statistics Department during 1971-1985. In this Annual Report of Activities for 2003, the department is pleased to provide highlights of its faculty, staff, students, curriculum changes, course offerings, graduates, scholarly and professional accomplishments, and service activities.

This has been a very exciting and successful year! Some of the significant events of 2003 are:

- The Department currently has to 13.5 faculty with the retirement of Joe Padgett, resignation of Lori Thombs, and the hiring of Instructor Stanley Haines. Joe remains active in the Department as Distinguished Professor Emeritus.
- The department is outgrowing quarters due to its growing graduate program and the additional faculty.
- New computer projection systems were put into 210A and 210B using monies provided by the college. This completes the enhancement of the three classrooms (201A and 210A&B) controlled by the department. The Statistics Conference Room was also enhanced with such a system.
- Statistics course enrollments are continuing to increase at a steady rate, and are on target to exceed all previous totals again in the Spring 2004 semester.
- More core courses for the Certificate of Graduate Study in Applied Statistics, the M.S. degree and the Master of Industrial Statistics degree are being offered via Distance Education.
- Research activities are at full throttle and external funding is continuing at an all-time high level.
- The faculty members are increasingly being recognized nationally and internationally, which is evidenced by their funded research projects, invitations to present talks, and selection for professional awards--two have been elected in recent years to membership in the International Statistical Institute, five are Fellows of the American Statistical Association, one is a Fellow of the Institute of Mathematical Statistics, and other awards for recognition at the local and national levels are being obtained. This year
 - Joe Padgett received the Paul Menton Service Award for the Southern Regional Council on Statistics.
 - Webster West's company, Integrated Analytics LLC, was recognized as a USC Technology Graduate.

FACULTY AND STAFF
(Effective Fall 2003)

Professors:

James Lynch (Ph.D. Florida State University, 1974)
John Spurrier (Ph.D. University of Missouri, Columbia, 1974)
Donald Edwards (Ph.D. Ohio State University, 1981)
Edsel Pena (Ph.D. Florida State University, 1986)
Walter Piegorsch (Ph.D. Cornell University, 1984)

Associate Professors:

John Grego (Ph.D. Pennsylvania State University, 1989)
Peter Waddell (Ph.D. Massey University, Biology, 1996)
Webster West (Ph.D. University of Arkansas, 1994)

Assistant Professors:

Nancy Glenn (Ph.D. Rice University, 2002)
Brian Habing (Ph.D. University of Illinois, Urbana-Champaign, 1998)
Kerrie Nelson (Ph.D. University of Washington, Seattle, 2002)

Instructors:

Georgiana Baker (M.S. University of South Carolina, Columbia, 1996)
Tammiee Dickenson (M.S. University of South Carolina, Columbia, 1996)
Stanley Haines (M.S. Georgia Tech, 1992)

Emeritus Professors:

William Padgett (Ph.D. Virginia Polytechnic Institute & State University, 1971)

Adjunct Faculty:

J.Wanzer Drane (Ph.D. Emory University, 1963)
James W. Hardin (Ph.D. Texas A&M, 1992)
Huynh Huynh (P.D. University of Iowa, 1969)
Andrew B. Lawson (Ph.D. University of St. Andrews, U.K., 1991)
Elizabeth H. Slate (Ph.D. Carnegie Melon, 1991)
R. Cary Tuckfield (Ph.D. Indiana University, 1985)
Machelle Wilson (Ph.D. University of California, Davis, 2002).

Statistical Laboratory:

Roumen Vesselinov (Ph.D. Univ. of Economics, Sofia, Bulgaria)

Computing Staff:

Minna Moore

Office Staff:

Debra Williams
Anita Wood

Visiting Faculty:

Chang Kang (Ph.D. University of Minnesota, 1990), Hanyang University, KOREA

STUDENTS

Graduate Students for Spring semester 2003

Keith Anderson	Kirby Jackson	Russell Stocker
Melanie Autin	Hang Lai	DengFang Tang
Parul Bhargava	Bartholomew Kelly	Meredith Tomlinson
Brooke Buckley	Cerissa Newdigate	Francisco Vera
Samuel Croker	Jun Ni	Jue Wang
David Hare	Robert Parody	Zhixue Wang
Jun Han	Andrea Phillips	Hua Wen
Dong Hai	Maureen Petkewich	Yuping Wu
Theodor Gamishev	Jonathan Quiton	Phillip Yates
Balarama Gundapanini	Wendy Roth	Litong Zhang

Graduate Students for Fall semester 2003

Keith Anderson	Kirby Jackson	Russell Stocker
Melanie Autin	Hang Lai	DengFang Tang
Parul Bhargava	Bartholomew Kelly	Meredith Tomlinson
Brooke Buckley	Cerissa Newditate	Francisco Vera
Samuel Croker	Jun Ni	Jue Wang
David Hare	Robert Parody	Zhixue Wang
Jun Han	Andrea Phillips	Hua Wen
Dong Hai	Maureen Petkewich	Yuping Wu
Theodor Gamishev	Jonathan Quiton	Phillip Yates
Balarama Gundapanini	Wendy Roth	Litong Zhang

Undergraduate Students for the year 2003

Tristan Amer	James Cathy	Jennifer Geisler
Terri Armstrong-Koch	Nancy Chalmers	Lindsey Martin
Julie Barnes	Elizabeth Coffey	Jon Oldhouser
Brandon Bell	Bonnie Coggins	James Tanis
Jonathan Bouknight	Colin Crawford	Rebecca Way
Bever-Leigh Bowers	Dianne Davis	Sean Wolfe
Rachel Breuer	Shyla Deveaux	Casey Wood
Andreea Brezaie	Marisa Garcia-Quinana	

Graduate Student Awards 2003

USC Graduate School Fellowship:	Brooke Buckley, Melanie Autin, Meredith Tomlinson
USC College of Science and Mathematics Graduate Fellowship:	Robert Parody, Emma McKinney, Alice Adams-Bonaimé
W.J. Padgett Graduate Fellowship:	Andrea Phillips, Roland Deutsch, Thomas Jaki

Undergraduate Student awards 2003

Mu Sigma Rho: Holly Battenhouse
Stephen D. Durham Award: Zachary Samples

Graduates in 2003

Doctor of Philosophy:

Bhargava, Parul, Exact Confidence Bounds Comparing Two Regression Lines With a Control Regression Line (Spurrier)
Tomlinson, Meredith, Inference for Accelerated Test Models Based on Failures or Degradation Data from Cumulative Damage Data from Cumulative Damage Processes (Padgett)
Daniela Nitcheva, Multiple Comparisons in Low-Dose Risk Assessment with Quantal Response Data (Piegorisch)

Master of Science:

Newdigate, Cerissa, Multistage Stratified Sampling with Ratio Estimators and Unequal Probabilities (Grego)
Petkewich, Maureen, Multiple Comparisons for Additional Risk with Nonquantal Data (Piegorisch)
Tang, Defang, Benchmark Dose Multiplicity Adjustment with Nonquantal Data (Piegorisch)
Wang, Zhixue, Selecting the Number of Latent Classes in a Joint Model with Longitudinal Markers and Time to Event Occurrence (Pena)
Anderson Keith, Gene Expression Analysis VIA Multidimensional Scaling (Waddell)

Master of Industrial Statistics:

Chris Finney and David Stamps

Certificate in Applied Statistics:

Kenneth Araujo

Bachelor of Science:

Holly Battenhouse, Kelly Kiggans, Kevin Liebrecht, Zachary Samples

FACULTY/STAFF HONORS AND AWARDS

Nancy Glenn	Lifelong Commitment to the Pursuit of Scholarship and Excellence, University of South Carolina.
William Padgett	Title of Distinguished Professor Emeritus Paul Minton Service Award from the Southern Regional Council on Statistics
Webster West	USC Technology Incubator Graduate (Integrated Analytics LLC).

COURSES AND CURRICULUM

All courses continued to have enrollment during the year. The courses, enrollments, and instructors were:

Spring Semester, 2003:

Course	Enrollment	Instructors
SCCC 312A	20	Spurrier
STAT 110	558	Glenn, Baker, West, Dickenson, Haines, Parody, Roth, Nichols, Yates, Heidari
STAT 201	411	Dickenson, Quiton, Phillips, Finch, Autin, Buckley, Bhargava, Hare, Newdigate, Wheatley, Haines
STAT 399	1	Grego
STAT 506	18	Grego
STAT 509	144	Lynch, Baker, Sims
STAT 510	10	Padgett
STAT/MATH 511	7	Trifonov
STAT 515	66	Glenn, Habing
STAT 516	29	Habing
STAT 519	16	Nelson
STAT 701	13	Nelson
STAT 705	19	Edwards
STAT 708/BIOS 808	16	Edwards
STAT/MATH 711	11	Pena
STAT 713	14	Padgett
STAT 715	6	Piegorsch
STAT 720	8	Thombs
STAT 775/BIOS 815	9	Piegorsch
STAT 791	12	Grego
STAT 795	8	Piegorsch
STAT 798	1	Padgett
STAT 799	6	Edwards, Padgett, Grego, Pena, Piegorsch
STAT 890	4	Padgett, Grego, Pena, Lynch
STAT 899	7	Spurrier, Padgett, Grego, Pena, Piegorsch
STAT/BIOL 777	7	Waddell
STAT/EDRM 828	5	Huynh

Summer Session I, 2003:

STAT 110	37	Baker
STAT 201	48	Roth, Autin, Philips
STAT 509	19	Baker
MATH/STAT 511	12	Hare
STAT 515	21	Bhargava
STAT 518	10	Hussey
STAT 798	2	Spurrier, Pena
STAT 799	2	Habing, Piegorsch
STAT 898	2	Piegorsch
STAT 899	6	Spurrier, Padgett, Grego, Pena, Piegorsch

Summer Session II, 2003:

STAT 110	26	Buckley
STAT 201	26	Quiton, Philips
STAT 512	12	Kang
STAT 516	11	Yates
STAT 750	9	Edwards
STAT 798	2	Grego
STAT 899	1	Lynch

Fall Semester, 2003:

SCCC 312A	24	Piegorsch
STAT 110	602	Haines, Glenn, West, Dickenson, Parody, Hare, Roth, Gundapaneni
STAT 201	455	Dickenson, Nelson, Haines, Quiton, Jaki, Bonaime, Ballou, McLain, Yates, Wu, Philips, Autin, Buckley, Wheatley
STAT 509	151	Baker, Glenn, Sims
STAT 513	15	Pena
STAT 515	83	Waddell, Habing
STAT 517	25	Edwards
STAT 530	34	Habing
STAT 590	5	Spurrier
STAT 700	19	Nelson
STAT 704	16	Edwards
STAT 706	14	Grego
STAT 712	16	Piegorsch
STAT 714	16	Spurrier
STAT 722	12	Lynch
STAT 790	11	Grego
STAT 795	12	Piegorsch
STAT 798	2	Edwards, Habing
STAT 799	7	Waddell, Edwards, Grego, Pena
STAT 898	1	Piegorsch
STAT 899	3	Lynch, Spurrier
STAT J704	8	Edwards
STAT/MATH 511	33	Spurrier
STAT/MGSC 525	18	Baker
STAT/CSCE 582	1	Valtorta

SCHOLARLY ACTIVITIES

Publications

Books/Other:

- J. D. Lynch and W.J. Padgett (2003) "Reliability Models Motivated by Failure of Brittle Fibers and Composites" Chapter in *Mathematical Reliability: An Expository Perspective*. Editors T. Mazzuchi, N. Singpurwalla and R. Soyer, Kluwer Publishers
- Sneh Gulati and William J. Padgett, *Parametric and Nonparametric Inference from Record-Breaking Data*, Springer Verlag Lecture Notes in Statistics, 172, January 2003.
- W.J. Padgett, "Application of the Weibull Distribution to Material Strength, " in *The Weibull Distribution: Theory, Methods and Applications*, N. Balakrishnan and A.P. Basu, Eds., in press.
- W.J. Owen and W.J. Padgett, "Accelerated Test Models with the Birnbaum-Saunders Distribution," in *Reliability Handbook*, H. Pham, Ed., Springer, in press.
- A. Onar and W.J. Padgett, "Cumulative Damage Approaches Leading to Inverse Gaussian Accelerated Test Models," In *Handbook of Statistics: Survival Analysis*, N. Balakrishnan and C.R. Rao, Eds., Elsevier Science Publishers, in press. (1.) Published online and via hardcopy the Abstract Book of the ICRSA 2003 Conference. (2.) Published online and via hardcopy the Program Book of ICRSA 2003 Conference.
- Stout, W., Bolt, D., Goodwin Froelich, A., Habing, B., Hartz, S., & Roussos, L. "Development of a SIBTEST bundle methodology for improving test equity with applications for GRE®test development (GRE Board Professional Report No. 98-15P)." Princeton, NJ: Educational Testing Service, 2003.

Papers in Print:

- Spurrer, John D., "On the Null Distribution of the Kruskal-Wallis Statistic", *Journal of Nonparametric Statistics*, 15, 685-691, 2003.
- Tu, W. and Piegorsch, W.W. Empirical Bayes analysis for a hierarchical Poisson generalized linear model. *Journal of Statistical Planning and Inference* 11, 235-248 (2003).
- Simmons, S.J., Piegorsch, W.W., Nitcheva, D., and Zeiger, E. Combining environmental information via hierarchical modeling: An example using mutagenic potencies. *Environmetrics* 14, 159-168 (2003).
- Pan, W., Piegorsch, W.W., and West, R.W. Exact one-sided simultaneous confidence bands via Uusipaikka's method. *Annals of the Institute of Statistical Mathematics* 55, 243-250 (2003).
- Al-Saidy, O.M., Piegorsch, W.W., West, R.W., and Nitcheva D.K. Confidence bands for low-dose risk estimation with quantal response data. *Biometrics* 59, 1056-1062 (2003).
- Gielazyn, M.L., Ringwood, A.H., Piegorsch, W.W., and Stancyk, S.E. Detection of oxidative DNA damage in isolated marine bivalve hemocytes using the comet assay and formamidopyrimidine glycosylase (Fpg). *Mutation Research* 542, 15-22 (2003).
- A. Onar and W.J. Padgett, "A Penalized Local D-Optimality Approach to Design for Accelerated Test Models," *Journal of Statistical Planning and Inference*, Vol. 119, pp 411-420, 2004.
- W.J. Padgett and Meredith A. Tomlinson, "Lower Confidence Bounds for Percentiles of Weibull and Birnbaum-Saunders Distributions," *Journal of Statistical Computation and Simulation*, Vol. 73, pp. 429-443, 2003.
- Thompson, ML and Nelson, KP. Linear regression with Type I and left-interval censored response data. *Environmental and Ecological Statistics* (2003)
- Street, W. Scott IV, Don Edwards, Robert J. Feller, Bruce C. Coull, and Stephen E. Stancyk. "Mixed-Model Splines for Environmental Time Series". *Environmetrics* 14: 643-649 (2003)
- Peter J. Waddell. Evaluating the Accuracy of Evolutionary Trees from Sequence Data. New Zealand Statistical Association 2003 Conference. Massey University. New Zealand, July 2, 2003.

- Waddell, P.J. and Shelley, S. (2003). Evaluating placental inter-ordinal phylogenies with novel sequences including RAG1, gamma-fibrinogen, ND6, and mt-tRNA, plus MCMC-driven nucleotide, amino acid, and codon models. *Molecular Phylogenetics and Evolution* 28:197-224.
- Feng, X. Buell, D.A., Rose, J.R., and Waddell, P.J. (2003). Algorithms for Bayesian Phylogenetic Inference. *Journal of Parallel and Distributed Computing: Special Issue on High Performance Computational Biology*: 63-707-718.
- Rest, J.S., Ast, J.C., Austin, C.C. Tibbets, E.A., Hay, J.M., Waddell, P.J. and Mindell, D.P. (2003). Molecular systematics of primary reptilian lineages and the tuatara mitochondrial genome. *Molecular Phylogenetics Evolution*. 29:289-297.
- Pena, E. and Hollander, M. (2004). Models for Recurrent Phenomena in Survival Analysis and Reliability. In *Mathematical Reliability: An Expository Perspective* (eds. T. Mazzuchi, N. Singpurwalla, R. Soyer), pp. 105-123.
- Pena, E. (2003). Classes of fixed-order and adaptive smooth goodness-of-fit tests with discrete right-censored data. Chapter 31 in *Mathematical and Statistical Methods in Reliability: Series on Quality, Reliability, and Engineering Statistics* (eds. B. Lindqvist and K. Doksum), pp. 487-501.
- Gonzalez, JR and Pena, E. (2003). Bootstrapping median survival with recurrent event data. In *Proceedings of the 9th Spanish Conference on Biometrics*, pp. 349-352.
- Padgett, W., Lynch, J. and Pena, E. (2003). ICRSA 2003. *Amstat News*. p. 10.
- Habing, B., & Roussos, L.A. "On the need for negative local item dependence", *Psychometrika*, 68, 435-451, 2003.
- Lengvarsky, Z. and West, R.W. (2002) "Influence contours in linear regression," *Computational Statistics*, 17:465-477.

Papers in Press:

- Gleaton, J. U. and Lynch, J. D. "On the Distribution of the Breaking Strain of a Bundle of Brittle Elastic Fibers" to appear in *Advances in Applied Probability*, 36, 2004
- Piegorsch, W.W. Sample sizes for improved binomial confidence intervals. *Computational Statistics and Data Analysis*.
- J.G. Surlles and W.J. Padgett, "Some Properties of a Scaled Burr Type X Distribution," *Journal of Statistical Planning and Inference*.
- W.J. Padgett and Meredith A. Tomlinson, "Inference from Accelerated Degradation and Failure Data Based on Gaussian Process Models," *Lifetime Data Analysis*.
- Michele D. Nichols and W.J. Padgett, "A Bootstrap Control Charge for Weibull Percentiles," *Quality and Reliability Engineering Internation*.
- Gonzalez, JR and Pena, E. (2004). Estimation no parametrica de la funcion de supervivencia para datos con eventos recurrentes (in Spanish). To appear in *Revista Espanola de Salud Publica*, Vol. xx, pp. xxx-xxx.
- E. Ezra, Z.J. Gregor, and Moorfields Macular Hole Study Group, "Surgery for Idiopathic Full-thickness Macular Hole: 2-year Results of a Prospective Randomised Clinical Trial Comparing Natural History, Vitrectomy and Vitrectomy Plus Autologous Serum," *Archives of Ophthalmology* (to appear in February 2004)
- Piegorsch, W.W., West, R.W., Pan, W., and Kodell, R.L. Low-dose risk estimation via simultaneous statistical inferences. *Journal of the Royal Statistical Society, series C (Applied Statistics)*.

Papers Submitted:

- Vera, Francisco and Lynch, James (2003), "Iterated total time on test transforms."
- Gielazyn, M.L., Ringwood, A.H., Piegorsch, W.W., and Stancyk, S.E. Reproductive effects in oyster gametes exposed to hexavalent chromium and cadmium, and the effects of glutathione status.
- Piegorsch, W.W., Simmons, S.J., and Zeiger, E. Data mining potency estimators from toxicological databases.
- Nitcheva D.K., Piegorsch, W.W., West, R.W., and Kodell, R.L. Multiplicity-adjusted inferences in risk assessment: Benchmark analysis with quantal response data.

- Parul Bhargava and John D. Spurrier, Exact Confidence Bounds for Comparing Two Regression Lines with a Control on a Fixed Interval
- Nelson, KP and Leroux BG, Statistical models for autocorrelated data. *Statistics in Medicine* (2003)
- Edwards, Don, G.Ward-Besser, J.Lasecki, B. Parker, K.Wieduwilt, F.Wu, and P.Moorhead. "The Minimum Sum Method and Other Distribution-Free Procedures for Audited Payment Populations".
- Whitlock, Jacqueline B., D.E. Porter, H.N. McKellar, Jr., T.J.Temples and D. Edwards. "Development of a GIS-based Suitability Model to Determine the Distribution of Hydrilla in a South Carolina Reservoir."
- Nancy Glenn, "Robust Empirical Likelihood Point Estimation," *Biometrika*
- Renaë Brodie and Nancy Glenn, "Reinvasion of Low Salinity Adult Habitats Following Marine Planktonic Development in the Fiddler Crab, *Uca minax*: Distribution of Early Life Stages Along a Salinity Gradient in a South Carolina Salt Marsh," *Marine Biology*
- Nancy Glenn, "Robust Bayesian Empirical Likelihood," *Biometrika*.
- Nancy Glenn, "Using the EM Algorithm to Derive Robust Empirical Likelihood Weight Vectors," *JASA*.
- Nancy Glenn, "Multivariate Robust Empirical Likelihood Point Estimation," *Biometrika*.
- Waddell, P.J., Miao, J., and Kishino, H. (2003). Measuring Stochastic Error on Trees and Regulatory Networks Using the 'robust Bayesian Estimator $X+Y_i$. *Molecular Biology and Evolution*. Submitted.
- Agustin, Z. and Pena, E. (2003). A basis approach to goodness-of-fit testing in recurrent event models. This has been tentatively accepted by the *Journal of Statistical Planning and Inference*, and the revised version has been sent back.
- Pena, E. and Slate, E. (2003). Global Validation of Linear Model Assumptions. The original version of this was submitted to *JASA* and they invited a revision. This revised version addressing the issues in the review is about to be sent back to *JASA* this January 2004.
- Kvam, P. and Pena, E. (2003). Estimating Load-Sharing Properties in a Dynamic Reliability System. A revised version addressing the *JASA* reviewers comments is underway. The review was favorable, but it is not yet certain whether *JASA* will accept it.
- Dukic, V. and Pena, E. (2003). Variance estimation in a model with Gaussian sub-models. This is the revised version and is currently under review by *JASA*. The review of the original was favorable but it is not yet certain if it will be accepted by *JASA*.
- Pena, E., Slate, E. and Gonzalez, J. (2003). Semiparametric inference for a general class of models for recurrent events. Submitted to *JASA*, Nov 2003, and is currently under review.
- Hollander, M. and Pena, E. (2003). Nonparametric methods in reliability. Submitted to *Statistical Science* this December 2003, and currently under review.
- Pena, E. and Lai, H. (2003). Sample size determination for comparing two Poisson rates. Submitted to *Computational Statistics and Data Analysis* this past Dec. 2003, and is currently under review. (Accepted in the *Mathematics Preprint Server* as of Dec 30, 2003)
- Finch, H. & Habing, B. "Comparison of NOHARM and DETECT in Item Cluster Recovery: Counting Dimensions and Allocating Items". Accepted with revision and being revised for the *Journal of Educational Measurement*.
- Froelich, A.G. & Habing, B. "Conditional Covariance Based Subtest Selection for DIMTEST." Accepted with revision and being revised for *Applied Psychological Measurement*.
- Finch, H. & Habing, B. "Performance of DIMTEST and NOHARM based statistics for testing unidimensionality." Being revised for resubmission to *Applied Psychological Measurement*.
- Habing, B., Finch, H., & Roberts, J.S. "A Q3 Statistic for Unfolding Item Response Theory Models." Accepted with revision and being revised for *Applied Psychological Measurement*.
- Habing, B., & Donoghue, J.R. "Applications of the NIRT Parametric Bootstrap to Pairwise Local Dependence Assessment." Under review by the *Journal of Educational and Behavioral Statistics*.
- West, R.W., Wu, Y., and Heydt, D., An Introduction to WebStat 3.0, *Journal of Statistical Software*.
- Piegorsch, W., West, R.W., Pan, W. and Kodell R.L. "Low-dose risk estimation via simultaneous statistical inferences", *Applied Statistics*.
- West, R.W. and Kodell. R.L. "Changepoint alternatives to the NOAEL," *JABES*.

Kegan, B. and West, R.W. "Modeling the simple epidemic with random differential equations."
Mathematical Biosciences.

Book Reviews:

Peter J. Waddell and Michael McLachlan (2003). "Genomics," In Press in Encyclopedia of Genetics: Second Edition" ed.: Bryan Ness, Salem Press, Pasadena, CA.

Peter J. Waddell and Michael McLachlan (2003). "Complementary RNA and RNAi" In Press in Encyclopedia of Genetics: Second Edition" ed.: Bryan Ness, Salem Press, Pasadena, CA.

Peter J. Waddell (2003). "Bioinformatics" In Press in McGill Medical Encyclopedia, Salem Press, Pasadena, CA.

Waddell, P.J., Miao, J., and Kishino, H. (2003). Measuring Stochastic Error on Trees and Regulatory Networks Using the 'robust Bayesian Estimator X+Yi. Department of Statistics Technical Report, September 2003.

Review of the book "Introduction to nonparametric Item response theory". Journal of the American Statistical Association, 98 (463), 774-775, 2003.

Papers Presented at Meetings

Invited:

James Lynch. "On the distribution of the Breaking Strain of a Bundle of Brittle Elastic Fibers" at the Nonparametric Statistics Conference at Florida State University, January 17-18, 2003

Walter Piegorsch. Session chair: "Perceptions of Risk and Nanotechnology: How safe is Safe Enough?" International Conference on Discovering the Nanoscale, University of South Carolina, Columbia, SC.

Kerrie Nelson. New Researcher's Conference, University of California, Davis

Donald Edwards. EPA Grass Shrimp workshop: Patterns and Issues in Grass Shrimp Abundance studies

Nancy Glenn. USC Bioinformatics Symposium

Nancy Glenn. Richard Tapia Computing Conference

Nancy Glenn. Purdue University - CAARMS

Nancy Glenn. Joint Mathematics Meeting

Edsel Pena. Gave an invited talk dealing with modeling and inference for recurrent events at the ICRSA 2003 conference held in USC.

Brian Habing. Comparison of NOHARM and DETECT in item cluster recovery: counting dimensions and allocating items. With Holmes Finch and Huynh

Huynh. Presented at the Annual Meeting of the National Council on Measurement in Education, April 24, 2003. (Competitive proposal submission with approximately 50% acceptance rate)

Brian Habing. Comparison of NOHARM and conditional covariance methods of dimensionality assessment. With Holmes Finch and Huynh Huynh. Presented at the Annual Meeting of the American Educational Research Association, April, 21, 2003, Chicago, IL. (Competitive proposal submission with approximately 50% acceptance rate)

Webster West. Enhanced statistical graphics: New capabilities of WebStat, Joint Statistical Meetings, San Francisco, CA.

Webster West. Interactive tools for teaching interactive statistics, Beyond The Formula, Monroe Community College, Rochester, NY.

Webster West. WebStat: A tool for educational data analysis, Beyond The Formula, Monroe Community College, Rochester, NY.

Webster West. WebStat 3.0: Web-based software for statistics education, International Biometric Society, Eastern North American Region, Tampa FL.

Contributed:

John Spurrier. Parul Bhargava and John D. Spurrier, "Exact One-Sided Confidence Bounds Comparing Two Regression Lines", Joint Statistical Meetings, San Francisco

John Spurrier. David R. Hare and John D. Spurrier, "Simultaneous Inference for Two Rations of Linear Combinations of General Linear Model Parameters", Joint Statistical Meetings, San Francisco

William Padgett. Joint Poster Session with M.A. Tomlinson, ICRSA 2003, May 21-24, USC, Columbia, SC

Kerrie Nelson. ENAR conference, Tampa, Florida

John Grego. "An Inventory Control Model", IMS/SPES Spring Research Conference, Dayton, OH (6/03)

Edsel Pena. ENAR Meeting in Tampa, Florida. Presented a contributed talk dealing with inference after model selection.

Edsel Pena. Presented a contributed talk at the Joint Statistical Meeting in San Francisco. The talk dealt with global validation of linear model assumptions.

Conferences and Meetings Attended

Baker	International Conference on Reliability and Survival Analysis.
Dickenson	Attended Annual Conference of the South Carolina Educators for the Practical Use of Research in Columbia SC. . Attended the International Conference on Reliability and Survival Analysis in Columbia SC.
Edwards	SC ASA spring meeting. Joint Statistical Meetings, San Francisco, August 2003.
Glenn	USC International Conference on Reliability and Survival Analysis. Tenure and Promotion Workshop.
Lynch	Grant Overview, Budget Development & Post Award Grant Processing Workshop. ISRSA-2003, May 21-24, USC, Columbia, SC. SRCOS Summer Research Conference, June 2003, Jekyll Island, GA.
Padgett	Nonparametric Statistics Conference at Florida State University, January 17-18, 2003. ICRSA, 2003, May 21-24, USC, Columbia, SC. Annual Meeting of the SC Chapter of ASA, Columbia, SC April 2003. Southern Regional Council on Statistics Summer Research Conference, Jekyll Island, GA, June 2003.
Pena	ENAR Meeting at Tampa, March 2003. SCASA Meeting at Columbia, SC, April 2003. ICRSA Conference at Columbia, SC, May 2003. Jekyll Island Meeting, June 2003. Joint Statistical Meeting, San Francisco, CA, August 2003. StatFest 2003, Raleigh, NC, Nov. 2003.
Piegorsch	33rd Annual Meeting, ASA SC Chapter, Columbia, SC. Joint Statistical Meetings, San Francisco, CA. Nanoscale Interdisciplinary Research Team (NIRT) Workshop, Pisgah Forest, NC.
Spurrier	Annual Meeting of S.C. Chapter of the American Statistical Association. Joint Statistical Meetings, San Francisco.
Waddell	New Zealand Statistical Association 2003 Conference. Massey University, Palmerston North, New Zealand. Summer Research Conference in Statistics, 2003. "Statistics in Genetics, Molecular Biology and Bioinformatics", hosted by the University of Georgia, Jekyll Island, Georgia.

Conferences/Sessions Organized/Chaired

Grego	Invited Session Chair, "Multivariate SPC", IMS/SPES Spring Research Conference, Dayton, OH (6/03).
Habing	Division D 2004 Annual Meeting Co-chair for the American Educational Research Association.

- Lynch On Organizing Committee for International Conference on Reliability and Survival Analysis - 2003.
- Nelson International Conference on Reliability and Survival Analysis (ICRSA 2003): Chaired session on "Residual Life Functions".
- Pena Together with Professors Padgett and Lynch we organized the International Conference on Reliability and Survival Analysis which was held here at USC last May 2003.
- Spurrer Session Chair, International Conference on Reliability and Survival Analysis, Columbia SC.

Outside Research Seminars and Colloquia Presented

- Edwards USC Statistics Colloquium: "The Minimum Sum Method" March 2003.
Palmetto GBA: samptest: a program to analyze Medicare investigation sampling plans. (September 2003).
Palmetto GBA: samptest workshop. October 2003.
- Glenn USC Department of Statistics.
Invited Speaker - Spelman College - Department of Mathematics.
Invited Speaker - University of Alabama - Department of Biostatistics.
Invited Speaker - USC Department of Computer Science and Engineering.
Invited Speaker - University of Georgia Statistics Department Colloquium.
- Grego Microarray Analysis, Statistics Department, Fall 2003.
- Habing "Nonparametric IRT-Based Scale Construction." University of South Carolina, Department of Statistics.
- Lynch Organized Reliability Seminar and supervised Francisco Vera (my Ph.D. Student) who presented lectures (at USC).
- Nelson Department of Statistics, University of Georgia.
Department of Biometrics, Medical University of South Carolina .
Department of Statistics, University of South Carolina.
- Padgett Department of Statistics, University of South Carolina (jointly with M. Tomlinson), February 6, 2003.
Department of Mathematical Sciences, Clemson University, April 22, 2003.
- Pena Presented a colloquium talk at the Department of Biostatistics, The University of Michigan, Ann Arbor. The talk dealt with models and inference for recurrent event data.
Presented a colloquium talk at the Department of Health Studies, The University of Chicago. The talk dealt with models and inference for recurrent event data.
- Waddell A robust approach to Bayesian posterior probabilities for trees, USC Symposium on Bioinformatics, USC Columbia.
Consensus clustering, graphical modelling and correspondence analysis:
Three alternative methods of microarray data analysis. Arnold School of Public Health, USC, Columbia.
Evaluating the Accuracy of Evolutionary Trees from Sequence Data. New Zealand Statistical Association 2003 Conference, Massey University, New Zealand.
An X-rated examination of the modern Phylogenies of placental mammal order. Bioinformatics Research Center. North Carolina State University.

Talks for General Audiences

- Glenn NC State University - Statfest.
Keynote Address - Lincoln High School Commencement.
- Padgett Colloquium talk to Kappa Mu Epsilon (Math Club), Winthrop University, April 17, 2003.

- Pena Attended and gave a presentation at STATFEST held in North Carolina State University. The purpose of this was to provide information about the graduate program to potential students, in particular, minority students.
- Spurrier "Statisticians Rule" USC COSM Frontiers Night.
Careers in Statistics, Irmo High School, 2 presentations.
Finding a Job - a Major Marketing Effort, USC Mathematics and Statistics Career Night, 2 presentations.
Lectured at USC's Adventure in Science Summer Camp.

STATISTICS DEPARTMENT COLLOQUIUM SERIES

Spring 2003:

- W.J Padgett & Meredith Tomlinson – USC
Inference for Accelerated Test Models Based on Gaussian Degradation Processes
- Vijayan N. Nair - University of Michigan
Active Network Tomography and Bicast Probing Experiments
- Don Edwards - University of South Carolina
The Minimum Sum Method and Other Distribution-Free Procedures for Audited Payment Populations
- Robert F. Woolson - Medical University of SC
A Statistician's Perspective on Directing a Coordinating Center for an Acute Ischemic Stroke Trial

Fall 2003:

- Kerri Nelson - University of South Carolina
Comparison of Iterative Bias Correction with Other Methods for Estimation in Generalized Linear Mixed Models
- James W. Hardin - University of South Carolina
The Sandwich Variance Estimator
- Dongchu Sun - University of Missouri
Estimating the Precision and Covariance Matrices in a Star-shaped Model
- Cary Tuckfield - Savannah River Technology Center
Statistical Thinking for Ecologists and Other Dyed-in-the-Wool Frequentists
- Charity G. Moore - University of South Carolina
Statistical Applications at the SC Rural Health Research Center
- Brian Habing - University of South Carolina
Nonparametric IRT-Based Scale Construction
- Nancy Glenn - University of South Carolina
Robust Bayesian Empirical Likelihood

Grants and Contracts in Effect

The outside research/contract funding in effect during 2003 is listed below. The details of STATLAB funding are listed in its separate annual report

NAME	AGENCY	DATES IN EFFECT	AMOUNT
Edwards	BellSouth	2002-2003	\$5,000
Edwards	NOAA	2002-2004	\$4,000
Grego	Crantford & Assoc	2003-2003	\$3,414
Grego	Dept Speech & Comm Disorders USC	2003-2003	\$7,500
Grego	NSF	2003-2003	\$16,590
Grego	Robert Bosch Corp	2001-2003	\$2,964
Grego	SC Department of Public Safety	2002-2003	\$66,831
Grego	SC Department of Public Safety	2003-2003	\$41,487
Grego	Commission on Higher Education	2002-2003	\$19,853
Grego	Commission on Higher Education	2003-2004	\$11,000
Grego	Turner and Associates	2003-2003	\$3,500
Grego	Miscellaneous small projects	2003-2003	\$1,820
Habing	NSF-MMS	2001-2004	\$114,954
Habing	SC Dept. of Education	2003-2003	\$12,029
Padgett, Lynch	NSF	1999-2003	\$219,449
Padgett, Lynch	NSF	2003-2005	\$224,346
Padgett, Pena, Lynch	NSF	2002-2003	\$15,000
Pena	Cobre	2002-2003	\$100,181
Pena	Cobre	2003-2004	\$81,321
Pena	NIH	2003-2006	* \$919,784
Pena	NSF	2001-2004	\$165,000
Pena	USC/MUSC	2002-2004	\$30,000
Pena, Padgett	ARO	2002-2003	\$10,000
Pena, Padgett	NIH	2003-2004	\$10,000
Piegorsch	U.S. NSF	2002-2003	\$1,200
Piegorsch	NSF	2002-2003	\$8,398
Piegorsch, West	U.S. NCI	2000-2004	\$325,125
West, Lynch	NSF	2002-2005	\$130,002
Total outside Funding in effect for 2003			\$2,550,748

*Half this was subcontracted through USC to Cornell University.

EDITORIAL ACTIVITIES

Grego	Associate Editor, Journal of Statistical Computation and Simulation.
Habing	Statistical Methodology Editor for the "Journal of The First-Year Experience and Students in Transition."
Padgett	Associate Editor of Journal of Nonparametric Statistics, 1989-present. Associate Editor of Lifetime Data Analysis, 1994-December 2003. Associate Editor of Journal of Statistical Theory and Applications, 2001-2003. Editorial Advisory Board for Journal of Statistical Computation and Simulation, 1986-present. Co-Chair of Organizing Committee for the International Conference on Reliability and Survival Analysis (ICRSA2003) held at USC, May 21-24, 2003.
Pena	Associate Editor of the Journal of the American Statistical Association.
Piegorisch	Associate Editor, Environmetrics (1992-present). Associate Editor, Environmental and Ecological Statistics (1994-present). Associate Editor, Journal of the American Statist. Assoc.—Theory & Methods Section (1996-present). Associate Editor, Biometrics (1997-present). Member, Editorial Board, Mutation Research (1997-present). Member, Editorial board, Environmental and Molecular Mutagenesis 1994-present). Co-Guest Editor, Environmetrics Special Issue on Statistical Challenges in Environmental Health.
Spurrier	Editorial Board Member, Journal of Nonparametric Statistics.
West	Associate Editor Journal of Statistical Software. Associate Editor Communications in Statistics.

Reviewing and Refereeing

More than 90 manuscripts were reviewed by the faculty for the following journals:

American Statistician	Journal of Statistical Computation and Simulation
Annals of Statistics	Journal of Statistical Education
Applied Mathematics Letters	Journal of Statistical Planning and Inference
Applied Psychological Measurement	Journal of Statistical Software
Bioinformatics	Journal of the First Year Experience and Students in Transition
Biometrics	Mathematical Geology
Book chapters (two) for Prof. Allen James	Molecular Biology and Evolution
Communications in Statistics	Naval Research Logistics
Computational Statistics & Data Analysis	Psychological Methods
Computers and Mathematics	Psychometrika
Conservation Biology	Quality Control Text
Elementary Statistics Text	Regulatory Toxicology
IIE Transactions on Quality and Reliability Engineering	Statistical Science
JASA	Statistics and Probability Letters
Journal of Bioinformatics and Computational Biology	Systematic Biology
Journal of Computational and Graphical Statistics	Technical report for SCDNR
Journal of Molecular Phylogenetics and Evolution	Technometrics
Journal of Quality Technology	Trends in Ecology and Evolution

OTHER SERVICE TO THE PROFESSION AND STATISTICAL SOCIETIES

Baker	Regional Science Fair Judge. Appointed member of the Board of Advisors for Midlands Technical College Center for Quality.
Edwards	ASA-ENVR: CoS representative. ASA CoS: treasury subcommittee. ASA JABES management board. Mu Sigma Rho ad-hoc chapter recruitment committee (chair). Mu Sigma Rho Education Award committee (chair). Mu Sigma Rho Stat Bowl organizing committee, scorekeeper. Science Fair Awards judge. Mu Sigma Rho Council Representative.
Glenn	Judge for USC Central South Carolina Region II Science and Engineering Fair.
Grego	President and Research Chair, Friends of Congaree Swamp. Career Day Speaker--Meadowfield Elementary School.
Habing	South Carolina Region II Science Fair Judge, April 28, 2003. Guest AP Statistics Lecturer, White Knoll High School, October 30, 2003. Substitute AP Statistics Instructor, White Knoll High School, November 18 & 20, 2003.
Haines	Vice Chairman, Wateree District, Boy Scouts of America.
Padgett	Region II Science and Engineering Fair, Head Judge for Statistics Award.
Spurrier	Science Fair Judge and Presenter.

DEPARTMENTAL AND OTHER COMMITTEE SERVICE (Effective Fall 2003)

Departmental:

Assistant to the Chair Chairman's Advisory Committee	Baker Lynch (Chair), Baker, Spurrier, Edwards, Glenn, Grego, Padgett, Pena, Piegorsch
Colloquium Coordinator Computer Committee Distance Education Committee Faculty Search Committee	Piegorsch (Chair), Lynch West (Chair), Habing, Nelson Edwards (Chair), Baker, Glenn, Grego, West Edwards (Chair), Piegorsch (Chair), Grego, Habing, Padgett
Faculty Senator Graduate Advisory Committee Graduate Director Graduate Director, Assistant Library Representative Mu Sigma Rho Advisor Nominations and Awards Committee Peer Review of Assistant Professors Peer Review of Associate Professors Peer Review of Teaching Committee Ph.D. Admission to Candidacy Committee	West Pena (Chair), Edwards, Nelson, West Pena Edwards Padgett, Pena Edwards West (Chair), Edwards, Glenn, Padgett, Pena Grego (Chair), Lynch, Spurrier, Edwards, Pena, Piegorsch (Chair), Lynch, Spurrier, Edwards, Pena Spurrier (Chair), Pena Edwards (Chair), Grego, Habing, Nelson, Piegorsch
Ph.D. Comprehensive Exam Committee	Spurrier (Chair), Lynch, Glenn, Pena, West Piegorsch, West
Post-Tenure Review Committee Promotion and Tenure Committee	Spurrier (Chair), Lynch, Edwards, Padgett, Pena Spurrier (Chair), Edwards

Reliability and Quality Sciences Center Director	Lynch
Self Study Annual Assessment Committee	Lynch (Chair), Baker, Spurrier, Pena
Space Utilization Committee	Spurrier (Chair), Baker, Lynch
STAT 110 Course Coordinator	Baker
STAT 201 Course Coordinator	Dickenson
STAT 509 Course Coordinator	Baker, Lynch
STAT 515 Coordinator	Habing
Statistical Laboratory Director	Grego (Chair)
Statistics Club Advisor	Habing
StatLab Advisory Committee	Grego (Chair), Lynch, Spurrier, Edwards
Undergraduate Advisory Committee	Spurrier (Chair), Glenn, Habing, Piegorsch, Waddell
Undergraduate Director	Spurrier
VIGRE - TBA Committee	Lynch (Chair), Spurrier, Pena
Webmaster	Nelson

College of Science and Mathematics:

Centers of Econ Excel Review Committee	Edwards
College Computing Committee	West
COSM Space Committee	Spurrier
Institute for Biological Research and Technology	Waddell
Petitions and Standards Committee	Habing

University:

Amoco Award Committee	Spurrier
Assessment Advisory Committee	Habing
Faculty Advisory Board for SCAMP	Edwards
Promotion and Tenure Committee	Edwards
Russell/Ed. Found. Research Awards Comm.	Piegorsch (Chair), Padgett
Salary Equity Committee	Spurrier
SCAMP Executive Committee	Grego
School of Environmental Education Committee	Edwards
Strategic Directions and Initiatives Committee	Padgett
Tenure Review Board	Spurrier (Chair)

STUDENT ORGANIZATIONS

USC Statistics Club	USC Chapter of Mu Sigma Rho
Advisor: Lori Thombs (Spring 2003)	Advisor: Don Edwards
Brian Habing (Fall 2003)	Officers:
Officers:	Spring Meredith Tomlinson, President
Spring Robert Parody, President	Brooke Buckley, VP
Bonnie Coggins, Vice President	David Hare, Secretary
Justin Guy, Secretary	Russ Stocker, Treasurer
Russ Stocker, Treasurer	Fall David Hare, President
Fall Robert Parody, President	Russ Stocker, VP
Bonnie Coggins, VP	Brooke Buckley, Secretary
Tristan Amer, Secretary	Rob Parody, Treasurer
Andreea Brezaie, Treasurer	

Stat Club began the spring semester with a hike in the Congaree Swamp led by John Grego. Also in the spring, Jennifer Lasecki of Palmetto GBA gave an excellent presentation on that company's activities in curbing Medicare fraud and abuse. Palmetto GBA is one of the Midlands' largest employers of statisticians. Another excellent presentation was given by Bonnie Kegan (M.S.'91) about her work at the U.S. Census Bureau. Science Fair judges and the University Showcase booth personnel were also drawn from the Stat Club / Mu Sigma Rho ranks.

The annual picnic was again held on campus in May on the lawn outside LeConte with absolutely gorgeous weather. The biggest Mu Sigma Rho activity for the year, however, was the co-sponsorship of three doctoral students to attend the Joint Statistical Meetings in San Francisco. Parul Bhargava, Russ Stocker, and David Hare were supported in part by local Mu Sigma Rho funds, and in part by national Mu Sigma Rho funds, to attend the meeting, where they competed in the Stat Bowl competition. Russ Stocker placed 6th overall.

This fall the Stat Club and Mu Sigma Rho hosted with Phi Mu Epsilon, the mathematics honor society, the second annual careers night. John Spurrier gave some useful tips regarding interviewing and Georgie Baker gave some valuable insights based on her own career experiences. The university career center, biostatistics and the US Army made other presentations. Stat Club finished the year off with a trip to see the lights before Christmas at the Riverbanks Zoo.

CONSULTING

Most of the formal statistical consulting with faculty, staff, students, local agencies and industry was performed through the Statistical Laboratory. A separate report on these activities is prepared each year by the Stat Lab Director and Manager. The Stat Lab participated in funded projects totaling over \$150,000 this year. Some faculty members of the department have also done statistical consulting work for individuals in other departments within the University, including Biology, Marine Science, Geography, Pharmacy, Computer Science, Social Work, Music, Baruch Institute, Genetics Counseling, Exercise Science, Mathematics, Marketing, Geology, USC Medical School, and the Center for Colon Cancer Research. Outside consulting by faculty included Palmetto GBA Corporation, US Public Health Service, SC Department of Natural Resources, TriCenturion, PBR, Midlands Technical College, Eastern Research Group, Versar Corp, Integrated Laboratory Systems, and the National Center for Toxicological Research (Arkansas).

CENTER FOR RELIABILITY AND QUALITY SCIENCES

The formation of the "Center for Reliability and Quality Sciences" (RQS Center) was formally approved by the S.C. Commission on Higher Education in May, 1990, providing a focus for the activities that had been ongoing in that area for several years. The Center is totally self-supporting with Dr. James Lynch as the director. The RQS Center is involved in offering short courses on statistical quality control issues and design of experiments, as well as offering consultations with business, government, and industry personnel. Short courses are available for offering, both on the USC-Columbia campus and on site at any requesting business, industrial concern, or government agency. The main activity in 2003 was the Center's involvement in the 2003 International Conference on Reliability and Survival Analysis, held on campus in May.

FACILITIES

The department continued to upgrade its computer equipment over the past year. Computers and projection equipment were upgraded in the three classrooms (LeConte 201A, 210A, 210B) using college funds and a teaching laboratory for elementary statistics (LeConte 205) was upgraded using lab fees. A computer projection system was also installed in the department conference room (LeConte 202).

The department now occupies the entire second floor of LeConte College except for one small classroom, in addition to two office areas on the first floor. All the classrooms controlled by the department support multimedia presentations. This provides approximately 13,000 square feet of space for offices, classrooms, conference room, teaching laboratories, the Statistical Laboratory, and the RQS Center.

CONCLUSION

The Department continuously strives for excellence in its teaching, research, service and other professional activities, as well as growth in its programs. As this annual report shows, the curriculum continues to be fine-tuned and adjusted as national needs and directions in statistics change, and course enrollments are steadily increasing each year. The evening and distance course offerings are continually being expanded to meet demand both within and outside the University. This is particularly the case with respect to the Master of Industrial Statistics degree program and the Certificate of Graduate Study in Applied Statistics program, since students are typically enrolled in those programs on a part-time basis and often at a distance. Departmental activities in all areas are at virtually an all-time high, and indications are that they will continue at least at this level.

James D. Lynch
Chairman
August, 2004