



**NEWSLETTER OF THE COLORADO – WYOMING CHAPTER
OF THE AMERICAN STATISTICAL ASSOCIATION**

Volume 34, Number 1

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Spring Meeting and Reliability Course

**Friday April 11, 2003 and
Saturday April 12, 2003**

National Center for Atmospheric Research

The spring meeting of the Colorado-Wyoming Chapter of the ASA will be held on **Friday, April 11, 2003**. On **Saturday, April 12**, a short course entitled **“Statistical Methods for Reliability Data”** will be given by **Luis A. Escobar**. Both events will be at the **Foothills Lab** of the **National Center for Atmospheric Research (NCAR)**, 3450 Mitchell Lane, in northeast Boulder. *Please note that this is a change in location from other years. Previously the meeting has been held at the Mesa Lab.* A registration form for the meeting is included with this newsletter and on the chapter web site (address listed in the contact information near the end of this newsletter). Directions to the Foothills Lab are on the registration form. Additionally, you will find a map to the NCAR Foothills Lab at <http://www.ucar.edu/ucar/bouldermap.html>

The schedule of the spring meeting will be as follows:

- 1:00 pm Check in and social time
- 1:15 Election of officers
- 1:30 Student awards
- 1:45 Jay Breidt, CSU*
- 2:45 Break
- 2:55 Philippe Naveau, CU Boulder*
- 3:55 Break
- 4:05 Student Presentations
- 5:30 Cocktail Hour
- 6:30 Dinner at Murphy’s restaurant
(optional, price not included in
meeting registration.)

* Titles and abstracts for these presentations appear in this newsletter.

The reliability course will run from 9am to 4pm on Saturday, April 12th, with lunch and coffee breaks. Registration at the door begins at 8:30am.

Meeting registration can be completed in advance by using the form included in this newsletter or at the door. There is a discount for registering for both the course and the spring meeting. Additionally, there is a discount for pre-registration for the reliability course. Prices are as follows:

	Students	Others
Postmarked by Monday, March 31:		
Spring meeting only	\$5	\$10
Reliability course only	\$25	\$45
Meeting and course	\$25	\$50
Postmarked after Monday, March 31 or at door:		
Spring meeting only	\$5	\$10
Reliability course only	\$35	\$55
Meeting and course	\$35	\$60



**CALL FOR STUDENT PAPERS
-- SPRING MEETING 2003**

The CO-WY ASA spring meeting on Friday, April 11, will feature a student presentation competition. Presentations should be fifteen minutes with up to an additional five minutes for questions. Our chapter members are very receptive to student talks, so this is an excellent opportunity for students to obtain some public speaking experience, perhaps before giving a subsequent related talk at a national meeting.

Certificates of participation will be presented at the social hour immediately following the chapter meeting, with a \$50 award given to the best student presentation.

Students wishing to participate in the presentation competition should submit an abstract of 200 words or less to Amy Biesterfeld, abiester@colorado.edu, by March 30, 2003.



As far as the laws of mathematics refer to reality, they are not certain, and as far as they are certain, they do not refer to reality.
-- Albert Einstein

STATISTICAL METHODS FOR RELIABILITY DATA

A course to be given in conjunction with the spring meeting by:

Luis A. Escobar, Louisiana State University

Reliability assurance processes in manufacturing industries require data-driven information for making product-design decisions. Life tests, accelerated life tests, and accelerated degradation tests are commonly used to collect reliability data. Data from products in the field provide another important source of useful reliability information. These reliability studies typically yield data that are censored and/or truncated, require the use of less familiar distributions like the Weibull, the lognormal, and the gamma, and call for inferences that involve extrapolation.

The purpose of this course is to make modern methods for analyzing failure-time and degradation data available to a wide audience of practitioners. The course will describe and illustrate the use of a mix of proven traditional techniques, enhanced and brought up to date with modern computer-based methodology. Topics to be covered include censored data, nonparametric estimation, probability plotting, maximum likelihood estimation, likelihood-based confidence intervals, acceleration models, accelerated life testing, and accelerated degradation testing. The general concepts and methods in this course also have applications in engineering, medicine, life sciences, sociology, economics, and other sciences. Most of the examples in the course will come from applications of product reliability, but some biological examples will also be presented to illustrate the breadth of application.

This course will focus primarily on applications, data, concepts, methods, and interpretation. There will be little or no theory presented and results of complicated computations will be illustrated graphically. As such, the required technical background for the course is minimal. The material in this course will be of interest and accessible to individuals ranging from engineers having had only one or two courses of statistics in their education/training through individuals with advanced degrees in statistics.

LUIS A. ESCOBAR is a Professor in the Department of Experimental Statistics, Louisiana State University. His research and consulting interests include statistical analysis of reliability data, accelerated testing, survival analysis, linear and non-linear models. Professor Escobar is an Associate Editor for Lifetime Data Analysis and past Associate Editor for *Technometrics*. He is a Fellow of the American Statistical Association and an elected member of the International Statistics Institute. Professor Escobar was awarded the 1999 Jack Youden Prize and he has won two awards for outstanding teaching at Louisiana State University. He is the co-author of *Statistical Methods for Reliability Data* (Wiley 1998) and several other book chapters. His publications have appeared in the engineering and statistical literature.

This course is sponsored by the ASA Council of Chapters (COC) Traveling Course Committee. The COC provides low-cost, local courses for Chapters. This is a chance for our members to hear an outstanding speaker, at our Chapter, at a very low cost.

A Statistical Methodology to Extract Pulse-like Signal in Climatic Times Series

An Invited Talk to be given at the spring meeting by:

Phillippe Naveau

Department of Applied Mathematics
University of Colorado at Boulder

Joint work with C. M. Ammann, H.S. Oh, and W. Guo

To understand the full range of climate variability, it is important to attribute past climate variations to particular forcing factors. In this talk, our main focus is to estimate the impact of strong but short-lived perturbations from large explosive volcanic eruptions on climate. An extraction method to model simultaneously the slowly changing background climate component and the superposed volcanic pulse-like events is presented and applied to a variety of climatic data sets. This approach based on a statistical multi-state space model provides an accurate estimator of the timing of an eruption. It not only allows for a more objective estimation of its associated amplitude, but at the same time it provides a posterior probability for each cooling event. The extraction results suggest that a clear cooling recognizable against the noise is restricted to a relatively small number of explosive volcanic events. Finally, the classification of events in terms of their impact is compared to other volcanic indices.



A Semiparametric Stochastic Mixed Model for Increment-Averaged Data with Application to Carbon Sequestration in Agricultural Soils

An Invited Talk to be given at the spring meeting by:

F. Jay Breidt

Department of Statistics
Colorado State University

Joint work with Nan-Jung Hsu and Stephen Ogle.

Adoption of conservation tillage practice in agriculture offers the potential to reduce greenhouse gas emissions. Studies comparing conservation tillage methods to traditional tillage pair fields under the two management systems and obtain soil core samples from each field. Within each core, carbon stock is recorded at multiple depth increments. These data represent not the instantaneous value at a particular depth, but the total or average over the increment at that depth. Such data have, effectively, been smoothed. A semi-parametric mixed model is developed for such


Any theory can be made to fit any facts by means of appropriate additional assumptions.

increment-averaged data. The model uses parametric fixed effects to represent covariate effects, random effects and a stochastic process to capture within-core correlation, and an integrated, smooth function to describe effects of depth. The model is formulated so that the instantaneous depth function is estimated as a natural cubic spline, using penalized maximum likelihood. Variance components and the smoothing parameter are estimated using restricted maximum likelihood. The methodology is applied to the problem of estimating change in carbon stock due to change in tillage practice.



WEB SITES FOR STATISTICAL SOFTWARE

The following web sites list statistical software. Both Webstat and R are free software! Statlib and the Journal of Statistical Software have contributed code free for download. If you know of any additional sites that should be added to the list, please email the URL to the newsletter editor (address provided at the end of this newsletter).

Minitab: <http://www.minitab.com>

“R” software: <http://www.R-project.org>

SAS and other products: <http://www.sas.com>

Spplus and other products:
<http://www.insightful.com/products/default.asp>

SPSS: <http://www.spss.com>

Statlib: <http://lib.stat.cmu.edu>

Webstat: <http://www.webstatsoftware.com>

The Journal of Statistical Software:
<http://www.jstatsoft.org>

WATCH THIS SPACE! – Each newsletter will feature a list of web sites of interest to statisticians. If you would like to nominate a site to be included, please send your suggestion to the newsletter editor.



President's Farewell

As outgoing president of the CO-WYO Chapter of the ASA, I would like to encourage all chapter members to attend the spring meeting on Friday, April 11th, as well as the reliability workshop on Saturday, April 12th.

I would also like to take this opportunity to thank the executive committee members for their efforts to support the chapter and its activities during my tenure as president. Special thanks to **Amy Biesterfeld**, president-elect; **Craig Williamson**, treasurer; **Tressa Fowler**, newsletter editor; **Jack Powers**, secretary; and **Jim zumBrunnen**, webmaster; and **Karen Kafadar**, ASA Chapter representative. These individuals spent countless hours organizing and planning chapter functions and activities and communicating information to the chapter members. I am sure that the leadership of the chapter is in good hands with Amy and this committee.

If any of you have read ASA's president Robert L. Mason's remarks in the February edition of Amstat News, I would like to echo these remarks. Growth in membership is the key to revitalizing our local chapter. Recruiting new members in our local educational institutions and local businesses is paramount for the continued success of the local chapter. Encourage colleagues to join the Colorado-Wyoming Chapter. New ideas about meetings, activities, and how the local chapter can better serve the membership is necessary to maintain the high quality of the offerings of the chapter. I would also like to encourage our members to consider holding an office in the local chapter.

It has been a pleasure to serve as both president-elect and president. I wish the CO-WYO Chapter and its members continued growth and success.

Jim Luhring
President
Colorado-Wyoming Chapter of the ASA



The Summer Institute in Applied Mathematics at the University of Colorado in Boulder

Professional Development Workshop for Secondary Teachers of Statistics

In July of 2003, the Department of Applied Mathematics at the University of Colorado in Boulder runs its fourth annual two-week workshop for secondary teachers of statistics, "Beyond the Norm: Summer Statistics for Secondary Teachers." The workshop is taught by Amy Biesterfeld of CU-Boulder and Jim Luhring of Cherry Creek High School.

The emphasis of the workshop is three-fold:

- (1) Review topics covered in introductory statistics courses;



Misquotations are the only quotations that are never misquoted."
- Hesketh Pearson

- (2) Introduce technological tools for performing statistical analysis including software packages, JAVA web applets, and TI-83 graphing calculators; and
- (3) Provide resources for teaching statistics (i.e. handouts, newspaper articles, classroom activities and internet web sites).

This workshop is part of The Summer Institute in Applied Mathematics, which is directed by Anne Dougherty of CU-Boulder (Anne.Dougherty@colorado.edu) and is funded by a CU-Boulder Outreach Committee Grant and a grant from the JR Woodhull/Logicon Teaching Professorship. Workshops in Calculus, Discrete Math and Algebra are also offered. We plan to continue and expand the Summer Institute in the years to come. More information on these workshops can be found at <http://amath.colorado.edu/outreach/>.



Winter Meeting Stats Anyone? IV

The fourth annual "Stats Anyone?" workshop was held February 8th, 2003 at Cherry Creek High School. This workshop is for high school Advanced Placement Statistics teachers in the Colorado-Wyoming area. Sponsors include Cherry Creek High School, Cherry Creek School District, and the Colorado-Wyoming Chapter of the American Statistical Association.

Roger Johnson from South Dakota School of Science & Technology was the featured speaker, giving two presentations, "Some Classroom Activities in Probability & Statistics" and "Record Values and Surviving Glacial Moraines". **Shirley Owens** of Grandview High School, **Tressa Fowler** of the National Center For Atmospheric Research and **Jim Luhring** of Cherry Creek High School also gave presentations. **Beth Sasse** from **Greeley West High School** closed the workshop with her presentation "The Quest for Lord Stanley's Cup". For more information on the content of this workshop, please contact Jim Luhring (contact information at the end of this newsletter).

Many thanks to **Kathy Smith**, principal of Cherry Creek High School, for providing lunch.



Locals Elected as Fellows of ASA

At the last JSM, two "locals" were elected as fellows of the American Statistical Association. **Richard Davis** is chair of the statistics department at CSU. **Douglas Nychka** is at NCAR. Congratulations on this great achievement!

Officer needed!

The Colorado-Wyoming Chapter needs a President-Elect for 2003/2004. Other offices will only be available if one of the current officers vacates his/her position to become president-elect. Anyone interested in becoming an officer, please contact Jim Luhring.

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