



JANUARY 1991

WASHINGTON  
STATISTICAL  
SOCIETY

# NEWSLETTER

January 8	Tuesday	Model-Based Inference for Small Areas for Binary Variables in the National Health Interview Survey
January 9	Wednesday	Multiple Comparisons: A New Large Class of Strictly Comparisonwise $t$ Tests and $t$ Intervals, Each Depending on One or More $F$ Ratios
January 9	Wednesday	Tolerance Groupings for Editing Banking Deposits Data: An Analysis of Variance of Variances
January 16	Wednesday	Realtime Validation of an Oil- and Gas-Resource Assessment for the Offshore Gulf of Mexico
January 23	Wednesday	Survey Sample Coverage as a Class of Measurement Error
January 31	Thursday	Applications of Markov and Semi-Markov "Reward" Processes

## ANNOUNCEMENTS

### Guidelines: Julius Shiskin Award for Economic Statistics

The Julius Shiskin Award has been established by the Washington Statistical Society Chapter of the American Statistical Association in memory of Julius Shiskin and to encourage others to engage in innovative work in economic statistics.

The Award is designed to honor an unusually original and important contribution in the development of economic statistics or in the use of economic statistics in interpreting the economy. The contribution could be in statistical research, in the development of statistical tools, in the application of computers, in the use of economic statistics to analyze and interpret the economy, in the management of statistical programs, or in developing public under-

standing of measurement issues, to all of which Mr. Shiskin contributed. Either individuals or groups in the public or private sector can be nominated.

The recipient will be chosen by representatives from the Bureau of Labor Statistics, Bureau of the Census, Bureau of Economic Analysis, Office of Management and Budget, National Bureau of Economic Research, National Association of Business Economists, and WSS, all of which Mr. Shiskin was associated with in his long and fruitful career. The Award will be presented with an honorarium of \$500 at the WSS Annual Dinner in June.

Nominations should be returned to the Julius Shiskin Award Committee, c/o American Statistical Association, 1429 Duke Street, Alexandria, Virginia 22314-3402. Completed nomination forms must be received by March 15.

## WASHINGTON STATISTICAL SOCIETY PROGRAM CHAIRS

**Agriculture & Natural Resources**  
Cynthia Clark 763-8558  
John Herbert 532-4544

**Social & Demographic Statistics**  
Harvey Schwartz 443-6990  
Tom Dietz 323-2916

**Short Courses**  
Glenn White 763-7524  
Donald Gantz 764-6565  
Brad Pafford 447-3623  
Sid Schwartz 268-3490

**Economics**  
John Ruser 523-1347  
Neil Ericsson 452-3709

**Methodology**  
Sam Slowinski 452-2622  
Sue Ahmed 357-6781

**Public Health & Biostatistics**  
Ed Lakatos 496-5905  
Gordon Lan 881-9260

**Physical Sciences & Engineering**  
Nozer Singpurwalla 994-7515  
Julia Abrahams 696-4320

**Statistical Computing**  
Nancy Flournoy 885-3127  
Sylvia Leaver 272-2350

**Quality Assurance**  
Stanley Freedman 586-2038  
John Galvin 272-5066

**Newsletter Editor**  
Stephen H. Cohen 523-7551

**Employment**  
Bill Arends 447-6812

## PROGRAM ABSTRACTS

**TOPIC:** MODEL-BASED INFERENCE FOR SMALL AREAS FOR BINARY VARIABLES IN THE NATIONAL HEALTH INTERVIEW SURVEY

**SPEAKERS:** Donald J. Maloc, Mathematical Statistician, and Joseph Sedransk, Visiting Scientist, Office of Research and Methodology, NCHS

**CHAIR:** James T. Massey, Chief, Survey Design Staff, Office of Research and Methodology, NCHS

**DATE & TIME:** Tuesday, January 8, 1991; 1:30 to 3:30 p.m.

**LOCATION:** National Center for Health Statistics, Auditorium, Presidential Building, 11th Floor, 6525 Belcrest Road, Hyattsville, Maryland 20782

**SPONSORS:** Office of Research and Methodology, NCHS and the Washington Statistical Society

**ABSTRACT:** The National Health Interview Survey (NHIS) is designed to produce precise estimates for the entire United States, but not for individual states. In this talk, we describe the process of developing a model-based approach for providing state estimates. First, we review the methodological framework. Then we describe in detail and illustrate our approach to modeling binary variables from the NHIS, using as covariates individual level characteristics such as age and sex and county level covariates such as per capita income and number of doctors per 1,000 population.

---

**TOPIC:** MULTIPLE COMPARISONS: A NEW LARGE CLASS OF STRICTLY COMPARISONWISE  $t$  TESTS AND  $t$  INTERVALS, EACH DEPENDING ON ONE OR MORE  $F$  RATIOS

**SPEAKER:** David B. Duncan, Courtesy Professor, Oregon State University, and Professor Emeritus, Johns Hopkins University

**CHAIR:** Nancy Geller, Biostatistics Research Branch, NHLBI

**DATE & TIME:** Wednesday, January 9, 1991; 12:00 p.m.

**LOCATION:** Conference Room 10, C Wing, Building 31, NIH, Bethesda, Maryland (shuttle every 10 minutes from Medical Center Metro)

**ABSTRACT:** One of the most philosophically interesting and practically important issues in experimental inference is that of deciding whether to use a comparisonwise or an experimentwise approach in solving a multiple comparisons problem. A good name for this is "the multiple comparisons dilemma" (Carmer and Walker 1982).

For many years now scientific investigators have favored the use of two near-comparisonwise rules: the New Multiple Range rule (Duncan 1955) (Sacaes 1990), and the  $F$ -protected Least Significant Difference rule (Fisher 1935). At the same time most of the rules being published in the statistical literature are ones based on the experimentwise approach initially proposed by Tukey (1951).

Since both the mathematical objectives of, and results from, the near-comparisonwise and the experimentwise approaches are as different as chalk from cheese, and since both are being recommended for the same class of real problems, the area of multiple comparisons is in a state of chaotic confusion; so much so, that even highly reputable statisticians from other areas have expressed doubts as to whether the subject is not completely artificial and not relevant to any real problems at all (see discussion of O'Neill and Wetherill 1971).

The first purpose of this talk is to review the considerable importance and elusive yet simple objectives of the large majority of, if not all, multiple comparison problems.

---

---

**PROGRAM ABSTRACTS (continued)**


---

The second is to give examples of the ways in which a strictly comparisonwise approach can be engineered, one which avoids the objections to the usual comparisonwise approach, by making use of additional important information in one or more of the relevant observed F ratios involved.

The third and final purpose is to show how the new comparisonwise approach is giving intuitively and theoretically better solutions than either of the previous approaches, together with promises of clearing up the existing confusion and disarray.

- 
- TOPIC:** TOLERANCE GROUPINGS FOR EDITING BANKING DEPOSITS DATA: AN ANALYSIS OF VARIANCE OF VARIANCES
- SPEAKERS:** David A. Pierce, Federal Reserve Board  
Laura L. Bauer-Gillis, Federal Reserve Board
- CHAIR:** Neil R. Ericsson, Federal Reserve Board
- DISCUSSANT:** Stuart Scott, Bureau of Labor Statistics
- DATE & TIME:** Wednesday, January 9, 1991; 12:00 to 1:30 p.m.
- LOCATION:** Room B-4001, Federal Reserve Board, 20th and C Streets, N.W. (entrance on the South side of C Street between 20th and 21st). Lunch will be available in the Federal Reserve Board cafeteria until 2:00 p.m. for those who wish to eat with the speakers after the seminar. Please call Margaret Gray at 452-3726 by 2:00 p.m. January 8. On arrival, sign in at the guard desk and state the purpose and room number of your visit.
- SPONSORS:** Federal Reserve Board and Economics Section, WSS
- ABSTRACT:** This paper presents an application of analysis of variance techniques which has led to a substantial simplification of editing criteria for U.S. Federal Reserve System data. The application involves comparing measures of spread of the dollar and percentage changes in the data, on which the editing tolerances are based, and using multiple comparison methods to classify the financial institutions which report these data into homogeneous groups for constructing the tolerances. The data display extensive nonnormality and cell heteroskedasticity, and methodology is developed to deal with these problems. The classification of institutions resulting from this study, based on size, location, and type, has resulted in more than an 80% reduction in the number of edit tolerance groupings relative to those previously in use, and an increase in efficiency and accuracy of the editing process.
- 
- TOPIC:** REALTIME VALIDATION OF AN OIL- AND GAS-RESOURCE ASSESSMENT FOR THE OFFSHORE GULF OF MEXICO
- SPEAKER:** L. J. Drew, U.S. Geological Survey
- CHAIR:** John Herbert, Department of Energy
- DISCUSSANT:** Benjamin Kedem, Math Department, University of Maryland
- DATE & TIME:** Wednesday, January 16, 1991; 12:00 to 1:30 p.m.
- LOCATION:** Room 5152, U.S. Department of Agriculture, South Building, 14th and Independence
- ABSTRACT:** The accuracy of a forecast made in 1980 of the number and the sizes of oil and gas fields expected to be discovered in the Miocene-Pliocene in the offshore Gulf of Mexico was determined by comparing the predicted and the actual results from the drilling of 1,832 wildcat wells between 1977 and 1985. This forecast used a two-stage procedure that was based on a discovery process model and the concept of economic truncation.
-

## PROGRAM ABSTRACTS (continued)

Between 1977 and 1985, 280 oil and gas fields were discovered in the Miocene-Pliocene trend; each field contained more than 729,000 barrels of oil equivalent. Collectively, these fields contained 3.38 billion barrels of oil equivalent based on 1988 reserve estimates. According to our forecast made in 1980 for the period between 1977 and 1985 for the Miocene-Pliocene trend, 222 fields would be discovered during the period and would contain 1.79 billion barrels of oil equivalent; this is an underestimate by 1.59 billion barrels of oil equivalent in this trend (47% low).

This underestimation of the amounts of oil and gas discovered during the 1977-85 period can be attributed, for the most part, to the field growth phenomenon. It is clear that a correction for field growth must be calculated and applied to those oil and gas fields used to assess the sizes and the number of undiscovered fields before future discovery rates can be forecast.

---

**TOPIC:** SURVEY SAMPLE COVERAGE AS A CLASS OF MEASUREMENT ERROR  
**SPEAKER:** Charles D. Cowan, Opinion Research Corporation  
**CHAIR:** Al Richman, AAPOR (Baltimore/Washington, D.C.)  
**DATE & TIME:** Wednesday, January 23, 1991; 12:30 to 2:00 p.m.  
**LOCATION:** GAO Auditorium (7th Floor)  
**SPONSORS:** AAPOR (American Association for Public Opinion Research) and WSS Methodology Section  
**ABSTRACT:** Sample surveys rely on the availability of a good listing of the population to use for selecting a sample. Construction and use of sampling frames for residential and business surveys can be quite complicated, and certainly frustrating since most constructed lists will still underrepresent the population to be surveyed. This talk will be nontechnical and consist of three parts: it will review recent studies designed to measure coverage in large-scale surveys, it will discuss coverage in different sources used for sampling frames for various private sector surveys, and finally it will attempt to put coverage problems into the broader class of measurement error problems.

---

**TOPIC:** APPLICATIONS OF MARKOV AND SEMI-MARKOV "REWARD" PROCESSES  
**SPEAKER:** Jon Sjogren, Air Force Office of Scientific Research  
**CHAIR:** Donald Gross, Acting Dean, SEAS  
**DATE & TIME:** Thursday, January 31, 1991; 11:00 a.m. to 12:00 noon  
**LOCATION:** Room 301, Staughton Hall, George Washington University, 707 22nd Street, N.W. (on 22nd between G and H Streets), close to Foggy Bottom-GWU Metro (blue/orange lines). Pay parking is available at GWU Marvin Center (800 21st Street: H Street entrance), and at 22nd and Eye Street garage.  
**SPONSORS:** The Washington Statistical Society, and GWU Departments of Operations Research and Electrical Engineering and Computer Science  
**ABSTRACT:** Finite-state Markov processes have been used to model the reliability of reconfigurable computing systems. "Reward" models allow the consideration of performance/reliability trade-offs in parallel/redundant systems. But it is questionable to insist on the Markovian ("memoryless") assumption for recovery mechanisms (e.g., a recovery could well be deterministic - constant). In reward models, probabilities depend on two variables: work accomplished and time elapsed. The Chapman-Kolmogorov equations become PDE's. One effective solution method involves double Laplace transforms. When considering semi-Markov processes, we end up with integral equations of convolution type, so transform methods are still feasible. An example is given of a "fault-tolerant software" architecture running under hard real-time constraints.

---

## ANNOUNCEMENTS (continued)

### **Volunteers Needed for Quantitative Literacy Interest Group**

The Howard County Public School Citizen Mathematics Advisory Panel is sponsoring Math Week in all county schools, K through 12, during the week of April 15-19, 1991. The purpose of this event is to provide activities which will promote mathematical awareness and interest. The Panel is also assembling a list of professional mathematicians and statisticians who are willing to speak to the students. They have requested the help of the WSS Quantitative Literacy Interest Group in making this the best possible experience for the students. We can help in at least two areas: ideas for activities and volunteers for speakers (the QL group will provide ASA slides and/or videotapes). If you can volunteer to help and/or are interested in serving on either the QL Interest Group or the Mathematics Advisory Panel, please contact Mike O'Donnell at work on (202) 485-0062 or at home on (301) 596-3238 (Washington area) or (301) 997-9183 (Baltimore area).

### **Academic Fair in Statistics**

*Presentations of Graduate Programs in Statistics* from degree granting institutions are scheduled from The American University, George Mason University, George Washington University, and University of Maryland. A presentation is also scheduled from the USDA Graduate School.

**Exhibits:** 12:30 to 1:30 p.m.; February 4, 1991

**Panel:** 1:00 to 3:00 p.m.

**Place:** The Ballroom at the Marvin Center, George Washington University, 800 21st Street, N.W. (two blocks from the Foggy Bottom Metro Station).

If your school or organization has a training program in advanced statistics that you would like to exhibit, please call Nancy Flournoy at The American University (202) 885-3127.

RSVP from large groups is appreciated. Please call Daphne Cox at (202) 885-3170.

### **Census Bureau's 1991 Annual Research Conference Announced**

The Census Bureau's 1991 Annual Research Conference will be held March 17-20, 1991 at the Holiday Inn Crowne Plaza in Arlington, Virginia, only 1/2 mile from National Airport and three blocks from Metro. ARC 1991 will comprise a mix of topics such as editing, estimation in the presence of outliers, statistical methods for use with missing data, the effect of sample attrition on estimation and analyzing data in the presence of missing data and nonsampling errors. For further information contact Ms. Maxine Anderson-Brown, ARC Conference Coordinator, Office of the Director, Bureau of the Census, Washington, D.C. 20233, 301/763-1150.

### **Science Fairs 1991**

Volunteers are now being solicited to represent the Washington Statistical Society as judges in local area science fairs next spring. For the past several years, WSS has provided special awards at these fairs to students whose projects demonstrate excellence in statistical theory or application. Those who have participated in this activity have very much enjoyed the opportunity to interact with these students and to observe the widely diverse projects which are presented. The WSS sponsors awards at fairs in Northern Virginia, suburban Maryland and the District of Columbia. The fairs are held on a Saturday morning in mid- to late March and early April. The only time required is that one Saturday morning, plus one weekday lunchtime meeting to discuss judging strategy and to distribute the awards to be given out at each fair.

If you would like to be a WSS science fair judge, or if you would like additional information about this activity, please contact Susan Ellenberg at (301) 496-0694; or send a note with your name, address, and daytime telephone number to Susan Ellenberg, Division of AIDS, NIAID, 6003 Executive Boulevard, Rockville, Maryland 20892.

## ANNOUNCEMENTS (continued)

### American Association for the Advancement of Science

AAAS91 will be held in Washington, D.C. February 14-19, 1991 at the Sheraton Washington Hotel and the Omni Shoreham. For information: AAAS Annual Meeting Registration, P.O. Box 23320, Alexandria, VA 22304.

- |         |  |
|---------|--|
| 2/13/91 | Derive - symbolic math package.                          |
| 3/13/91 | Forecast Master - time series forecasting.               |
| 4/10/91 | Shazam - a very complete econometric estimation package. |
| 5/15/91 | ???? wildcard - suggestions to Charlie Hallahan.         |

### Tentative Schedule of SIGSTAT Meetings

SIGSTAT is the Special Interest Group in Statistics in the Capital PC User Group. The tentative schedule of events through April is as follows:

- |        |  |
|--------|--|
| 1/9/91 | StatXact - unique package providing exact p-values and confidence intervals for contingency tables and k-sample tests. |
|--------|--|

All meetings are scheduled for Wednesdays from 12:30 to 1:30 p.m. in Room B-14, 1301 New York Avenue, N.W. The building is located midway between the Metro Center and McPherson Square Metro stops. If this is your first SIGSTAT meeting, call Charlie Hallahan, 786-1507, and leave your name in order to gain entry into the building.

## EMPLOYMENT COLUMN

The Washington Statistical Society Newsletter provides a service of notification of employment opportunities and descriptions of those seeking employment here in Washington. Readers are encouraged to take advantage of this feature of the newsletter. Deadline for inserting notices is 5 (five) weeks before the publication date. Those interested should write to: Bill Arends, USDA-NASS, Room 4133 South Building, Washington, D.C. 20250-2000, Phone 447-6812.

## JOB OPENINGS

### BIOSTATISTICIANS

Two positions, one Ph.D. (GS-1529-12/13/14) and one M.S. (GS-1530-9/11). Ph.D. position includes research in biostatistical methods and design and implementation of large clinical trials; M.S. position includes collaborative research in statistics and health. U.S. citizenship required.

CV or Application for Federal Employment (SF-171), including three references, to Dr. Nancy Geller, Chief, Biostatistics Research Branch, National Heart, Lung, and Blood Institute, Federal Building, Room 2A11, 7550 Wisconsin Avenue, Bethesda, Maryland 20892.

**NATIONAL HEART, LUNG, AND BLOOD INSTITUTE  
NATIONAL INSTITUTES OF HEALTH**

**JOB OPENINGS (continued)****STATISTICIAN GS/1529/9-12**

A position is available in the Division of Mathematics; Center for Food Safety and Applied Nutrition; FDA; Washington, D.C. The position involves the application of statistics in the design, analysis, and interpretation of experiments and large-scale sample surveys; the development of sampling plans; and research into statistical methodology applied to microbiology, toxicology, bioassay, quality assurance, and nutrition. Requires training and experience in statistics (applied and/or theoretical), both univariate and multivariate, and familiarity with SAS, BMDP, or SPSS. EOE M/F/V/H; smoke-free workplace. Send SF-171 and college transcript to Foster D. McClure, Chief; Quality Assurance and Program Evaluation Branch; Food and Drug Administration, Room 2015, HFF-116; 200 C Street, S.W.; Washington, D.C. 20204.

**STATISTICIAN GS/1529/9-12**

A position is available in the Division of Mathematics; Center for Food Safety and Applied Nutrition; FDA; Washington, D.C. The position involves the application of statistics in the design, analysis, and interpretation of experiments related to industry food and color additive petitions, Center laboratory investigations, and collaborative studies; and research into statistical methodology applied to microbiology, toxicology, bioassay, chemistry, and nutrition. Requires training and experience in statistics (applied and/or theoretical), both univariate and multivariate, and familiarity with SAS, BMDP, or SPSS. EOE M/F/V/H; smoke-free workplace. Send SF-171 and college transcript to Michael W. O'Donnell, Jr., Chief; Experimental Design and Evaluation Branch; Food and Drug Administration, Room 2005, HFF-114; 200 C Street, S.W.; Washington, D.C. 20204.

**SURVEY/HEALTH STATISTICIANS**

(Service Fellow Positions-equivalent to GS 11-14)

The Agency for Health Care Policy and Research (AHCPR) is recruiting for statisticians to join the Division of Statistics and Research Methodology within the Center for General Health Services Intramural Research (CGHSIR). Positions are available for a Ph.D. in statistics/biostatistics and a M.S. with experience in sample design, survey research, sampling, weights development, data analysis for complex surveys, imputation procedures and matching techniques. Familiarity with statistical software packages (particularly SAS) is required. Send SF-171 application forms and resume to: Dr. Steven B. Cohen, Director, Division of Statistics and Research Methodology, Agency for Health Care Policy and Research, Room 18A-55, 5600 Fishers Lane, Rockville, Maryland 20857.

## **JOB OPENINGS (continued)**

### **MATHEMATICAL STATISTICIANS (GS11/12/13)**

The Biometrics Branch of the Center for Veterinary Medicine, Food and Drug Administration, is seeking a Ph.D. mathematical statistician to provide mathematical and statistical support to the research and regulatory activities of the Center. The position involves reviewing and evaluating mathematical and statistical methods, procedures and concepts involved with new animal drug applications along with supporting tests, research, and clinical data. Oral and written communication skills are important. Proficiency in the use of personal computers and knowledge of SAS is helpful. Send SF-171 application forms and resume to: **Dr. Anna Nevius, Biometrics Branch, Center for Veterinary Medicine, Food & Drug Administration, Room 6B-21, 5600 Fishers Lane, Rockville, MD 20857** or call 301/443-1580 for additional information.

### **STATISTICIAN, GS-13**

The Petroleum Marketing Division of the Energy Information Administration is currently recruiting a GS-13 mathematical statistician. Incumbent is responsible for developing and evaluating sampling frames, sample designs, estimation techniques, and imputation procedures. Incumbent also evaluates and validates survey data and analyzes discontinuities caused by changes in sample designs or the rotation of the sample. Send an SF-171 and a copy of your latest performance appraisal to Paula Weir, EI-431, 1000 Independence Avenue, S.W., Washington, D.C. 20585.

### **VISITING FACULTY POSITIONS 1991 - 1992**

The Department of Statistics/Computer and Information Systems, of the George Washington University, has openings for one or two one-year appointments as Visiting Assistant/Associate Professor, in the area of statistics or statistical computing, beginning Fall 1991. The positions require a Ph.D. in the relevant area. Applicants for these positions should have a strong commitment to both teaching and research in statistics, statistical computing, or computer science. Applicants from all areas of statistics are invited.

Send applications including curriculum vitae, relevant reprints and three letters of reference to Professor A. D. Kirsch, Chairman, Department of Statistics/Computer and Information Systems, The George Washington University, Washington, D.C. 20052 by March 15, 1991. George Washington University is an equal opportunity/affirmative action employer.

---

**JOB OPENINGS (continued)****ENVIRONMENTAL STATISTICIAN**

RTI, a prestigious research organization with a successful history of providing technical and policy support to federal agencies, seeks an outstanding environmental statistician to work in its Environmental Research Planning Department in Washington, D.C. The position offers technical and project management responsibilities with a small group that helps the U.S. EPA develop statistically sound, well-planned monitoring, research and survey programs. Department efforts focus on controlling uncertainty to prescribed levels in data EPA will use to make key policy decisions.

Qualifications required are: M.S. or Ph.D. and 5 years experience with environmental programs involving collection, analysis and/or use of environmental data; strong quantitative background in Statistical Analysis and Simulation, Design of Surveys and Experiments, Decision Analysis, or Operations Research; strong writing and interpersonal skills; and familiarity or experience with risk assessment concepts. Project management experience is desirable.

RTI offers competitive salaries and benefits including choice of health plans, dental coverage and 3 weeks of vacation. For immediate consideration, forward resume and supporting information by January 16 to: RESEARCH TRIANGLE INSTITUTE; Attn. ERPD Recruiter; 1615 M Street, N.W. #740; Washington, D.C. 20036. EOE/Affirmative Action Employer.

**STATISTICIANS**

Advanced Computer Systems, Inc. (ACS), a fast growing small business, has a need for Statisticians at all levels (entry, mid and senior) of experience and education (BS, MS, PhD). Opportunities exist on recent multi-year contract award. Individuals selected will participate in assessment and evaluation of various energy information systems, survey statistics, data analysis and modeling.

Positions are available for both survey and mathematical statisticians. Familiarity with SAS, SPSS, and other statistical computer tools is desirable. ACS is a professional services firm oriented toward client and employee satisfaction and success. Competitive salaries, excellent benefits incl. 401K and Profit Sharing Plan.

Interested candidates please forward resume to: Personnel Coord. (ES-1).

**Advanced Computer Systems, Inc.**  
10530 Rosehaven St., Suite 520  
Fairfax, VA 22030

EOE



P.O. Box 70843  
Washington, D.C. 20024-0843

NON-PROFIT ORG.  
U. S. POSTAGE  
**PAID**  
FALLS CHURCH, VA.  
PERMIT NO. 186