



IAMG

No. 51 December 1995

Newsletter

Official Newsletter of the International Association for Mathematical Geology

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IAMG Awards

After lying in oblivion for several years, the **Journal of Mathematical Geology Best Paper Award** has been revived by acting editor **Dan Merriam**. The award committee has chosen the following winners for 1993 and 1994:

1993 shared by: **P. Goovaerts** - "Spatial orthogonality of the principal components computed from coregionalized variables" vol. 25/3

and **Vera Palowsky, Ricardo A. Olea and John C. Davis** - "Boundary assessment under uncertainty: A case study" vol. 25/2

1994: **Alberto S. Almeida and André G. Journel** - "Joint simulation of multiple variables with a Markov-type coregionalization model" vol. 26/5

The **President's Prize** for 1994 has been awarded to **Clayton V. Deutsch** of Stanford University, Department of Petroleum Engineering. The president's prize is awarded annually to an individual 35 years or younger who has made through publication an original and outstanding contribution to the application of mathematics to the geological sciences.

This summer I spent again six weeks in Russia, some in St. Peterburg, some in Moscow, and the rest in NW Siberia. I've come back, again asking myself, how do they do it? How can our Russian colleagues survive without abandoning science and scientific careers? Well, they can't - many of them. Visiting several institutes, I've seen some of them decimated because

From the Editor
From the Editor
From the Editor

people simple don't get paid and have to take jobs where they get money to survive. In one

place I was told, we would love to show you our data, but our computer expert just left for a bank job, and we don't know how to get the data out.

Several scientists have asked to be put on half day work, so that they can make some money selling goods on the streets - that's apparently much more lucrative than the roughly \$200 average monthly salary, provided the institute can pay them at all. Most people have to have some kind of side line to supplement their salary.

And still they do science and some of it very good. They manage to put on conferences, even international ones, although it's difficult to do. But it's one chance for them to keep the contact with western scientists.

Another problem they have in keeping up is the lack of money to pay for journal subscriptions. One colleague complained that there wasn't one library in St. Peterburg that has Organic Geochemistry. It's probably even worse in smaller towns. And this problem isn't limited to Russia; other former east block countries have similar shortages.

What can we do to help? Include Russian colleagues in research proposals. There are several countries now that have set up government funds specifically for this purpose. Donate subscriptions for journals. Ask the subscription department to give a reduced rate for this purpose. Visit your eastern colleagues for personal exchanges. Other ideas?



**International Association for Mathematical Geology
Council Members and Officers, 1992-1996**

President's Forum

GENERATIONAL VIEWS

President: Michael Ed. Hohn, West Virginia Geological and Economic Survey, P.O. Box 879, Morgantown, WV 26507-0879

Past President: Richard B. McCammon, U.S. Geological Survey, National Center 920, Reston, VA 22092

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Sitting over breakfast in Osaka early in November, Dick McCammon, Dan Merriam, and I were discussing the IAMG (of all things), when one of us remarked that the current set of officers is the first not to include at least one Charter Member of the association. It's true: twenty-seven years after the founding of the IAMG, it is in its second generation of existence and membership as reflected in its officers. In helping to carry out the business of our association, I am mindful of the traditions of the IAMG, and also aware of the need for meaningful and sensitive change.

Pondering the subject of life and the generations, I've come to the conclusion that one can view the field of mathematical geology in a broad sense as having progressed through three generations of scientists. The first comprises pioneering geologists that saw the need for quantification and the usefulness of statistics, even before the advent of computers. This group includes scientists such as William Christian Krumbein, Andrei Vistelius, John Griffiths, and Felix Chayes, all active in carrying out the kind of work we do long before the IAMG existed.

The second generation includes the founding members of the IAMG. These individuals saw the promise of mathematical geology, especially in alliance with the computer, which could be used to test their models and ideas. Many of them are still active in the association as Council members and editors, and serve as effective advocates of the IAMG and its activities.

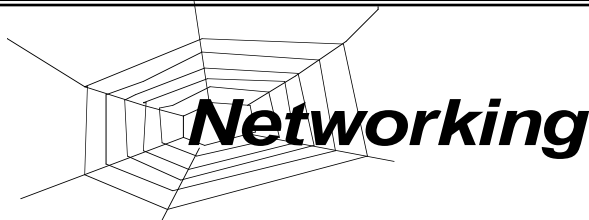
Then, there are us young upstarts. We have the luxury of taking the IAMG for granted, reading and contributing to the journals created by the founding generation.

Many people get the name of the IAMG wrong; it is the International Association FOR Mathematical Geology. According to the mission statement in our statutes, the IAMG exists to promote the field of mathematical geology, hence the "for". One way we can promote the field is recognition of individuals who have made important contributions, or have the promise to do so.

Our medals and prizes recognize contributions in several ways. The William Christian Krumbein Medal honors the important early contribution of the person for whom it is named, as well as the recipient. The President's Prize is given to a scientist 35 years of age or younger who has made significant contributions, and shows promise of making more.

Next year, with the election of new officers and council members, there will also appear a number of proposed

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The IAMG has upgraded its ftp site (iamg.org) to a world wide web (WWW) site. It can be reached at:

<http://www.iamg.org/iamg.html>

Take a look and tell us what you think about it. If you have suggestions or information that you think should be included, please contact **Eric Grunsky** at

ericg@mp.gsb.empr.gov.bc.ca

For those of you having trouble reaching iamg.org try the numerical IP address: 142.36.11.26. Eric prefers, however, that you use the first version of the address.

John C. Butler has agreed to write a monthly InterNet column for Computers & Geosciences "Another Node On the Net - ANON". A special issue devoted to InterNet resources for geoscientists has come out this summer already.

The editor and he are curious as to what function(s) a WWW home page could provide for those interested in topics normally included in Computers and Geosciences (and Mathematical Geology as well). Several ideas have been contributed which include:

- links to home pages of individuals with these interests
- links to abstracts of theses and dissertations related to these interests
- links to research "statements" - I am beginning a project on..... and need etc.

Net surfers who have ideas are encouraged to contact: jbutler@uh.edu

Do you have a favorite WWW home page that could be of interest to readers of this newsletter? Please share it with us! Send the info to h.poelchau@kfa-juelich.de

IAMG FTP SITE UPDATE

Most of the programs from Computers & Geosciences on the iamg.org ftp site have now been converted to ".sea.hqx" files for downloading to Macintosh computers. The ".sea" format (StuffIt Self-Extracting Archive) is commonly used for Macintosh files. The ".hqx" compression format is the common standard for transferring binary files for Macintosh computers. The conversion of these files has been kindly provided by:

Kevin Brewer

Assistant Professor of Hydrogeology
Rensselaer Polytechnic Inst.
kevinb@geo.rpi.edu

New program files added since the last newsletters are:

vol.	No.-Article No.
10	2-11
12	6-3
19	10-5; 6-6; 8-5
20	5-3
21	1-6, 8; 2-2, 9; 3-1; 5-2, 7

Most of these have been uploaded as .zip and .tar files but not yet as .sea.hqx versions.

INVITATION TO PARTICIPATE: Development of a **standard methodology for the statistical analysis of compositional data** in the earth sciences.

On 26 April 1994 the European Union (EU) adopted the Fourth Framework Programme for Research and Technological Development with a duration of 5 years (1994-1998). The programme contains four activities, the fourth of which is the stimulation of the training and mobility of researchers (TMR) programme, with the general objective to promote quantitative and qualitative increase of human resources within Europe. One way of pursuing this objective is through networks.

The rationale of the TMR Network Activity is to encourage research teams from different countries to work together on high quality joint research projects and, in this context, to promote the training and mobility of researchers, particularly young post-doctoral researchers.

The second call for proposals for European networks has a provisional deadline of 15 June 1996. We believe this is an opportunity to start a network based on practical aspects concerning the *evaluation of compositional data using statistical techniques*. Contacts in this direction have already been established with research groups from Italy, Germany and Spain, but a wider scope of participating groups would surely be helpful. A draft proposal follows, written with the purpose to motivate colleagues from the EU to join the project. People from outside the EU can join the project under specific circumstances.

RESEARCH OBJECTIVES (DRAFT)

General background: Many standard procedures in the earth sciences are based on a graphical and/or statistical evaluation of available data. Frequently these data are compositional in type, i.e. they are realizations of random vectors subject to a constant sum constraint, e.g. 100%. Compositional data present the problem of spurious correlation, mainly evidenced by the presence of negative correlations, induced by the constant sum.

The problem: In recent years the theoretical approach to the statistical analysis of compositional data has made significant advances, particularly due to the work by Aitchison (1986). However, as awareness of the problem increases, confusion commonly arises among practitioners since there are no widely accepted standards based on statistical techniques.

Objectives: The main objective of the proposed research project is the development of a methodology as a standard reference for the statistical analysis of compositional data in the earth sciences.

To achieve this goal, it is necessary to collect standard methods based on the evaluation of compositional data used in different fields of the earth sciences, e.g. ternary diagrams, scattergrams based on different ratios, etc., and perform a critical revision of these methods to determine if their actual use is adequate with the actual standard of scientific knowledge. This means that every single procedure has to be analyzed with respect to its statistical foundation; then the theoretical approach to the method has to be revised and finally its usefulness has to be checked with adequate data sets.

Methodological approach: Our purpose is to start with several selected case studies, where exhaustive data sets exist. They include the composition of sediments (grain size distribution, mineral composition, content of heavy minerals, chemical

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IAMG Journal Report

Current and future Contents:

COMPUTERS & GEOSCIENCES

volume 21, number 8 (1995)

- Introduction to the special issue on environmental computing, by K.M. Morgan and A.B. Busbey
- HER - Hydrologic Evaluation of Runoff; the Soil Conservation Service curve number technique as an interactive computer model, by M.J. Mack..
- Development of an Ice Information System (IIS) to be implemented at the NERSC, by A. Jacob
- Integration of remotely sensed satellite images with Geographical Information System, by N.M. Mattikalli, B.J. Devereux, and K.S. Richards..
- Improvements in shallow high-resolution seismic reflection through PC-based systems, by R.D. Miller, R.D. Markiewicz, C. Merey, J. Xia, and C.G. Maples
- Mapping micro-urban heat islands using LANDSAT TM and a GIS, by C. Aniello, K. Morgan, A. Busbey, and L. Newland
- Environmental probabilistic quantitative assessment methodologies, by R.A. Crovelli
- Simple effective resistivity-depth transformations for infield or real-time data processing, by M.A. Meju
- Basis for a flexible low-cost automated resistivity data acquisition and analysis system, by M.A. Meju and M. Montague
- Microcomputer-based classification of environmental data in municipal areas, by H. Thiergärtner

volume 21, number 9 (1995)

- Optimization of kinetic parameters for thermal degradation of kerogen: a Pascal program, by M.A. Bastow
- 'ParaDIS: a relational database for the consistent documentation and analysis of metamorphic mineral assemblages, by D.R. Schmatz, M. Engi, and J.E. Lieberman
- Two-dimensional polygon modeling using Windows graphical interface, by A.M. Parker
- Developing a variable-scale map projection for urban areas, by D. Fairbairn and G. Taylor
- CORSURF: a covariance-matrix trend analysis FORTRAN IV computer program, by W. C. Krumbein, W. Scherer, and D.F. Merriam
- COGS Contribution:
- Lineament analysis of satellite images using a Segment Tracing Algorithm (STA), by K. Koike, S. Nagano, and M. Ohmi

volume 21, number 10 (1995)

- Store well-logging data with objectstore ODBMS, by Li Haifei
- Which language should be used to sort multifield records, by J.L. Vigneresse
- DAINTY - a screen editor for data entry, by S. Rohatgi and S.G. Tewari
- MERCURY: an evidential reasoning image classifier, by D.R. Peddle
- A study of the impact of automated editing on polygon overlay analysis accuracy, by F. Wang and P. Donaghy
- SHORT NOTE:
- PASFORM - a program for IBM® PC or PC-compatible computers to calculate mineral formulae from electron microprobe and wet chemical analysis, by S.G. deBjerg, A. Mogessie, and E. Bjerg .

ANSI-C routines for the estimation of the lognormal mean, by F.H. Brown

Detection of ship wakes in SASR images using morphological operators, by A. Garzelli

volume 22, number 1 (1996)

- A FORTRAN77 program for solving of systems of linear equations by the method of minimal discrimination of unknown quantities; a procedure of stable inversion of geophysical data, by V.I. Starostenko and Zavorot'ko
- An algorithm for constructing extreme compositions, by Ross M. Renner
- Texture processing of synthetic radar data using second-order spatial statistics, by Otto C. Rotunno Filho, Paul M. Treitz, Eric D. Soulis, Philip J. Howarth, and Nicholas Kouwen
- Automated geostatistical seafloor classification -- Principles, parameters, feature vectors, and discrimination criteria, by Ute Christina Herzfeld and Chris A. Higginson
- Optimizing hydrocarbon generation calculations, by Larry J. Van Stone
- Optimizing time step size for apatite fission track annealing models, by Dale R. Issler
- An EXCEL macro for importing Log ASCII Standard (LAS) files into EXCEL worksheets, by Sait Ismail Ozkaya
- An artificial neural network (ANN) based software package for classification of remotely sensed data, by K.K. Mohanty and T.J. Majumdar
- SAPS - A completely automated and networked seismological acquisition and processing system, by Mihnea Corneliu Oncescu, Mihaela Rizescu and Klaus-Peter Bonjer

volume 22, number 2 (1996)

- AMPHICAL: a quickBASIC program for determining the amphibole name from electron microprobe analysis using the IMA rules, by F. Yavuz
- PHREEQEV: the incorporation of a version of Model V for organic complexation in aqueous solutions into the speciation code PHREEQE, by M.B. Crawford
- Tectonics, erosion, and sedimentation in an overthrust system: a numerical model, by E. Chalaron, J.L. Mugnier, W. Sassi, and G. Mascle
- A breadth-first quadtree coding scheme for multicolored spatial data, by H. K.-C. Chang and C.-K. Tso
- A computer-efficient plant canopy reflection model, by A. Kuusk
- MINENT: a FORTRAN program for prediction of enthalpy of formation of minerals with known crystal refinements, by P. Viellard
- COGS CONTRIBUTION
- A first-break algorithm for digitally acquired transient signals, by J.P. Coughlin

volume 22, number 3 (1996)

- Special Issue on Geophysics - Guest Editor: Neil Anderson
- This month in Computers & Geosciences (an introduction to the special issue on geophysics), by Neil L. Anderson
- MAPROS - a computer program for basement mapping and filtering of gravity and magnetic data using a Hartley transform, by B. Narasimha Rao, P. Rama Krishna, and A. Markandayulu
- FORTRAN program based on Granser's algorithm for inverting a gravity field resulting from a density interface, by R. Nagendra, P.V.S. Prasad, and V.L.S. Bhimasankaram
- Forward and inverse computer modeling of a gravity field resulting from a density interface using the Parker-Oldenberg method, by R. Nagendra, P.V.S. Prasad, and V.L.S. Bhimasankaram
- An efficient computer program for wave front calculation by the finite difference method, by P. Zhao
- The one-dimensional elastic wave equation: a finite-difference formulation for animated computer applications to full waveform propagation, by R.S. Williams, R.D. Rechten, and N.L. Anderson

A program for seismic wavefield modeling using finite-difference techniques, by D. Keiswetter, R. Black, and G. Schmeissner

A FORTRAN 77 program to compute seismic rays traveling inside a radially inhomogeneous earth by B.-S. Huang

SEISPACK - a 'HP-C' program for seismic refraction interpretation using ray inversion technique, by S.K. Nath, R. John, S.K. Singh, S. Sengupta, and H.P. Patra

A seismic case study of salt dissolution and subsidence in response to regional deformation, south-central Alberta, by N.L. Anderson, R.S. Williams, and R.C. Hinds

A seismic analysis of differential compaction in the Frasnian Duhamel Reef, south-central Alberta, by R.J. Brown, N.L. Anderson, and D.A. Cederwall

Short Note: A Windows application for generating input models for numerical modeling, by D. Keiswetter and B. Bennett

JOURNAL of MATHEMATICAL GEOLOGY

volume 27, number 5 (1995)

Optimization techniques for integrating spatial data, by U.C. Herzfeld and D.F. Merriam

Infill sampling criteria to locate extremes, by A.G. Watson and R.J. Barnes

Related information measures for the association of earth-science variables, by G. Pan

On the determination of paleoheat-flux using data on end-point state of thermal indicators, by A.K. Alekseev

Comparison of approaches to spatial estimation in a bivariate context, by M. Asli and D. Marcotte

Generalized cross validation for covariance model selection, by D. Marcotte

Inner product matrices, kriging, and nonparametric estimation of variogram, by S. Lele

volume 27, number 6 (1995)

An adaptive grid technique for minimizing heterogeneity of cells or elements, by T.H. Robey

A scheme for resampling, filtering, and subsampling unevenly spaced laser doppler anemometer data, by P. Biron, A.G. Roy, and J.L. Best

Conditional simulation with data subject to measurement error: post-simulation filtering with modified factorial kriging, by D. Marcotte

Characterizing heterogeneous permeable media with spatial statistics and tracer data using sequential simulated annealing, by A. Data-Gupa, L.W. Lake, and G.A. Pope

Open and closed compositional data in petrology, by E.H.T. Whitten

SHORTNOTE

Present situation and development of mathematical geology in Russia, by D.A. Rodionov

ASSOCIATION ANNOUNCEMENT

Memorial to D.A. Rodionov, by J. Harff

volume 27, number 7 (1995)

Random fractal models of heterogeneity; the Lévy-Stable approach, by S. Painter

Multifractal modeling and spatial point processes, by Q. Cheng and F.P. Agterberg

Automatic identification of rocks in thin sections using texture analysis, by L. Wang

Fitting matrix-valued variogram models by simultaneous diagonalization (Part I: Theory), by T. Xie and D.E. Myers

Fitting matrix-valued variogram models by simultaneous diagonalization (Part II: Application), by T. Xie, D.E. Myers, and A.E. Long

volume 27, number 8 (1995)

Determining the spatial scale of variation in soil radon concentration, by M.A. Oliver and I. Badr

Estimation and inference in inverse methods for kinetic models of hydrocarbon generation, by D.R. Fox

Moving averages for Gaussian simulation in two and three dimensions, by D.S. Oliver

volume 28, number 1 (1996)

Multifractal modeling and spatial statistics, by Q. Cheng and F.P. Agterberg

A simple method for estimating excess pressure over horsts from seismic sections, by R.D. Thomson and I. Lerche

Extreme value analysis of diamond-size distributions, by J. Caers, P. Vynckier, J. Beirlant, and L. Rombouts

Transport in a 2-D saturated porous medium; a new method for particle tracking, by F. Delay, H. Housset-Resche, F. Porel, and G. deMarsily

Comparison of kriging techniques in a space-time context, by P. Bogaert

Morphometry of microstromatolites in calcrete laminar crusts and a fractal model of their growth, by E.P. Verrecchia

Trend removal in spatially correlated datasets, by A. Singh and A.K. Singh

volume 28, number 2 (1996)

Special Issue: Inverse Theory in the Earth Sciences

Ute Christina Herzfeld, guest editor

Foreword, by U.C. Herzfeld

Inverse theory in the earth sciences - an introductory overview with emphasis on Gandin's method of optimum interpolation, by U.C. Herzfeld

Isotropic reproducing kernels for the inner of a sphere or spherical shell and their use as density covariance functions, by C.C. Tscherning

Determination and interpretation of preferred orientation with texture goniometry: an application of indicators to maximum entropy pole- to orientation-density inversion, by H. Schaeben and H. Siemes

Damped least-squares inversion of confined aquifer pumping data based on singular value decomposition, by Z. Yenihayat

Analytical modeling of glacier dynamics, by D.B. Bahr

volume 28, number 3 (1996)

Interpolation for geochemical surface reconstruction incorporating topographic catchment definitions, by P.M. Bartier and C.P. Keller

Complexity and scale in geomorphology: statistical self-similarity vs characteristic scales, by R. Andrieu

The updated kriging variance and optimal sample design, by H. Gao, J. Wang, and P. Zhao

Analytic signals for multivariate data, by M. Craig

On the maximum width of oil stringers under hydrodynamic flow conditions, by R.O. Thomsen and I. Lerche

Dynamic stochastic estimation of physical variables, by G. Christakos and V. R. Raghu

20 Years Ago in IAMG News Letter

Computers & Geoscience

The new IAMG journal devoted to publication of computer programs, algorithms, and articles on computation in the earth sciences, has gone to press. Volume 1 Number 1 is now at Pergamon Press, and Number 2 has been edited. The



Upcoming Meetings

First International Conference and Exhibition on COMPUTER GRAPHICS, DATABASES, COMPUTER MODELLING IN PETROLEUM GEOLOGY, St. Petersburg, **20-24 Nov. 1995**. VNIGRI, Liteny Ave. 39, St. Petersburg, 191104, Russia, Phone +7-812 273 43 83, Fax +7-812 273 73 87 or 275 57 56, e-mail ins@vnigri.spb.su

First International Conference on Theory and Practice of GEOLOGICAL-ECONOMICAL ESTIMATION OF DIFFERENT SCALE PETROLEUM-BEARING OBJECTS, St. Petersburg, **27 Nov.-1 Dec. 1995**. VNIGRI, Liteny Ave. 39, St. Petersburg, 191104, Russia, Phone +7-812 273 43 83, Fax +7-812 273 73 87, e-mail ins@vnigri.spb.su

American Geophysical Union, Fall Meeting, San Francisco, **11-15 December 1995**. AGU, 2000 Florida Ave NW, Washington, DC 20009, ph. 202 462-6900, fax 202 238-0566

SIAM Symposium on INVERSE PROBLEMS: GEOPHYSICAL APPLICATIONS, Mariott Tenaya Lodge at Yosemite Fish Camp, California, **15-19 December 1995**. SIAM, 3600 University City Science Center, Philadelphia, PA 19104-2688, ph. 215-382-9800 or 800-447-SIAM, fax 215-382-9800, e-mail service@siam.org

26th IWASA (Internationales Wasserbau Symposium Aachen): COMPUTATIONAL FLUID DYNAMICS, Aachen, **4-5 Jan. 1996**. Dipl. Ing. Volker Spark, RWTH Aachen, Inst. f. Wasserbau u. Wasserwirtschaft, Kreuzherrenstr., D-52056 Aachen, Germany, Ph. 49 241 807778, Fax 49 241 8888275, e-mail sp@wbsun1.iww.rwth-aachen.de

HYDROCARBON SEALS - Importance for Exploration and Production, Trondheim, Norway, **29-31 Jan. 1996**. Norwegian Petroleum Society, P. O. Box 1897 VIKA, 0124 Oslo, Norway, ph. +47 22 430050, fax +47 22 554630

PREDICTION IN GEOLOGY - Geologische Vereinigung and Koninklijk Nederlands Geologisch Mijnbouwkundig Genootschap Annual Meeting, Amsterdam, **22-24 February 1996**. Prof. Wolfgang Schlager, Vrije Univ./Earth Sciences, De Boelelaan 1085, NL-1081 HV Amsterdam, The Netherlands, ph. 0031-20-444-7390, fax 0031-20-646-2457, e-mail schw@geo.vu.nl

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS Annual Meeting, San Diego, **19-22 May 1996**. AAPG, Box 979, Tulsa, OK 74101. ph. 918 534-2555

2nd International Symposium on SPATIAL ACCURACY ASSESSMENT IN NATURAL RESOURCES AND ENVIRONMENTAL SCIENCES, Colorado State University, Fort Collins, **21-23 May 1996**. Dr. H. Todd Mowrer, Rocky Mountain Forest and Range Experiment Station, 240 W. Prospect, Fort Collins, CO 80526-2098, USA

Fourth International Workshop "HEAT FLOW AND THE STRUCTURE OF THE LITHOSPHERE", Castle of Trest, Czech Republic, **9-15 June 1996**. Vladimir Cermak, Geophysical Institute, Czech Acad.Sci., 141-31 Praha 4, ph. +42-2-764539, fax +42-2-761549, e-mail cermak@ig.cas.cz

30th INTERNATIONAL GEOLOGICAL CONGRESS and IAMG'96, Beijing, **4-14 August 1996**. Symposium 19-5 is on the general subject of mathematical and statistical methods in geology. It is intended for those wanting to present a paper for which there is no specialized symposium. Chang-Jo Chung and Mike Hohn are co-chairing this session along with Yu Jinsheng of China.

SPACE-TIME MODELLING OF BOUNDED NATURAL DOMAINS: Intelligent Tools for 3D-Interpolation and Correlation, Canterbury, UK, **13 - 18 September 1996**. H. H. Voss, Hannover, convenor. Info: Valerie Allspach, European Science Foundation, Strassbourg, e-mail euresco@esf.org

Fifth International GEOSTATISTICS CONGRESS, Wollongong, NSW, Australia, **22-27 September 1996**. Contact: Ernest Baafi, Department of Civil & Mining Engineering, University of Wollongong, Wollongong, NSW, Australia 2522, Fax: 61 42 21 3238, Tel: 61 42 21 3031

geoENV96 - First European Conference on GEOSTATISTICS FOR ENVIRONMENTAL APPLICATIONS, Lisbon, Portugal, **20-22 November 1996**. Instituto Superior Técnico, Av. Rovisco Pais, 1096 Lisboa Codex, Portugal. Phone +351 1 841 7247, Fax +351 1 841 7442, e-mail geostat@alfa.ist.utl.pt. Abstract deadline 31 Jan. 1996

COMPUTERIZED MODELING OF SEDIMENTARY SYSTEMS, Güstrow, **8-11 October 1996**. J. Harff, Baltic Sea Research Institute, Seestr. 15, 0119 Rostock, Germany (cosponsored by IAMG)

WORLD PETROLEUM CONG 1997, Beijing, **12-16 October 1997**

EUG 9 (European Union of Geosciences), Strasbourg, France, **31 March to 4 April 1997**



IAMG'97 in beautiful Barcelona!

The 1997 Annual Conference of the International Association for Mathematical Geology is scheduled for 22-27 September 1997 in Barcelona, Spain and will be organized by Vera Pawlowsky and Ricardo Olea. Find details and preregistration forms on the next two pages.

The Conference Theme will be the statistical analysis of compositional data, with special emphasis on geological data. Proposal from interested scientists and willing symposium organisers are requested on such topics as environmental studies, resource assessment and exploration, prediction and prevention of geological hazards, applications of geostatistics in different fields, computer applications in geology, theoretical developments in geostatistics, or other interesting areas of research.

Background of the Conference Theme

In many fields of the earth sciences---such as hydrochemistry, petrology and environmental geology---there are well established analytical techniques for rigorous analysis of samples. In contrast, there is a lack of generally accepted methodological procedures for the analysis and interpretation of compositional data.

In 1897, Pearson wrote one of his famous Mathematical Contributions to the Theory of Evolution entitled, „On a form of spurious correlation which may arise when indices are used in the measurement of organs.“ In this paper he mentioned, for the first time, the existence of spurious correlations when analysing indices, i.e., ratios with a common denominator. Since then, many scientists in different fields have attempted different approaches to overcome the problem, among them Felix Chayes, well known to the geoscience community for his work on compositional data, or closed systems, as he labeled them. One hundred years after Pearson's work the subject is still controversial, although many important advances have been made in this field, in particular the methodology proposed by John Aitchison.

Interested contributors for oral or poster presentations must submit a one-page abstract of 200-400 words in English without figures or references before January 30, 1997. Communications will be accepted on the basis of submitted abstracts by peer revision of at least two referees. Notification of paper's acceptance and instructions for camera-ready manuscript (maximum of four pages) will be mailed on March 31, 1997. Final camera-ready copy will be due before May 30, 1997. Participants of the conference will receive a volume with all presented papers. Following the conference, authors of selected papers will be invited to present an extended article to be published in a special volume.

Conference chair and vice-chair

Vera Pawlowsky Glahn, Universitat Politècnica de Catalunya, Spain

R.A.Olea, Kansas Geological Survey, USA

International Scientific Committee

A.Buccianti, Università degli Studi di Firenze, Italy

H.Burger, Freie Universität. Berlin, Germany

J.J.Egozcue Rubí, Universitat Politècnica de Catalunya, Spain

E.C.Grunsky, Ministry of Energy, Mines and Petroleum Resources, Canada

S.Sirotinskaya, Mathematical Methods Laboratory, Russia

Local Organizing Committee


M.C.Balbuena Martinez, Universitat Politècnica de Catalunya




C.Barceló Vidal, Universitat de Girona

A.Carmona Mejías, Universitat Politècnica de Catalunya

C.Hervada Sala, Universitat Politècnica de Catalunya

X.Sánchez Vila, Universitat Politècnica de Catalunya.

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CIMNE- Campus Nord (Edifici C1) UPC
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 UPC

Post
stamp
here

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Proposals for IAMG '98 venue

Next year, the IAMG council will be accepting proposals for the 1998 Annual Meeting. The deadline for receipt of proposals is **1 August 1996**. The IAMG council will make a decision shortly thereafter. Guidelines for preparing proposals are available from the Secretary General.

Secretary General **Ricardo Olea** reports a financial success story for the IAMG. For more than ten years the IAMG has reported to the IUGS (the International Union of Geologic Sciences) and applied for money in support of the association. So far only paperwork but no money. But this year Ricardo received a letter from IUGS letting him know that their Executive Committee had allocated US\$ 1,000 to the IAMG. As instructed in the letter he wrote to the IUGS treasurer, received the money in the mail, and now the check is in the hands of our treasurer. This check ends a drought of at least ten years. If renewed support from IUGS means anything, the IAMG must be doing good work again!

The **IAMG'95 in Osaka** was apparently a success, although at press time no detailed reports were available to present to our readers.

The following are the tentative statistics on this conference brought to you by Niishi Nishiwaki-Nakajima: More than 180 participants from 20 different countries. About 300 attended the six Open Lectures for Citizens. Number of papers submitted: 98; presented: 92. Six workshops were organized and one was cancelled. Simultaneous translation between English and Japanese for the Oct. 29 PM Open Lecture for Citizen and the Nov. 2 AM/PM Session VI. 100 people attended the Ice Breaker, 130 the Reception, and 60 the Farewell Party.

There were lots of Japanese-English papers - Dan Merriam counted 4 from US, 3 Germans, 1 from Spain, 2 Hungarians, about 4 Russians, 1 Norwegian, 2 Philipinos, 2 Canadians, tens of Chinese, and close to a hundred(?) Japanese. Papers were erratic, organization excellent, everything expensive, food superb, and weather nice.

President's Forum - from page 2

changes to our statutes and bylaws concerning medals of recognition. There are proposals to create two new medals, a John C. Griffiths Medal to recognize original work in the field of natural resources, and a Felix Chayes Medal to recognize original research in statistical petrology. The latter award was proposed by the widow of Dr. Chayes, and will be funded by a gift from Mrs. Chayes.

When the Presidents Prize was created at the General Assembly in 1980, it was originally proposed as the Vistelius Prize, but the current name was chosen because it was thought improper to name an award after a living scientist. With the recent death of Andrei Vistelius, we can name the award as originally intended. This will require modification of our statutes.

These changes will mean a broader recognition of the pioneers of our field. It is intended that the William Christian Krumbein Medal should remain to be the premier honor given by the IAMG.

Michael Ed. Hohn

TMR Network - from page 3

analysis of clay fraction, etc.), the hydrochemical composition of water and monitoring of gas-composition with respect to volcanologic events.

Those who are interested, please contact either one of us as soon as possible, or have a look at the Information Package for Research Networks published by the European Commission.

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10 Years Ago in IAMG

AN EDITORIAL about GEOBYTE

When rumors were first floated about a new AAPG journal on computers, IAMG officers reacted with some trepidation. After all, the AAPG dwarfs the IAMG in both size and financial resources, and our own journal Computers & Geosciences is chronically ailing. If the big society

chose, it could easily run C & G to the wall, preempting the growing audience of industrial geologists involved with computer applications.

IAMG President John Davis and C & G Editor Dan Merriam expressed the Association's concern to AAPG officials, with the result that AAPG took definite steps that will maximize cooperation between the two societies

and minimize the possibility of competition between their publications.....

Perhaps Geobyte will supply all of the information needs of most of its readership, but some will be inspired to learn more, to search deeper. They will turn to C & G and Math Geology

Editor's Note: GEOBYTE was discontinued after some seven years, and C & G appears to have survived nicely!

Financial Statement 1994

Board of Directors
International Association For Mathematical Geology
Denver, Colorado

We have reviewed the accompanying balance sheet -- cash basis of the International Association For Mathematical Geology, an unincorporated organization, as of December 31, 1994, and the related statement of revenue and expenses -- cash basis for the year then ended, in accordance with Statements on Standards for Accounting and Review Services issued by the American Institute of Certified Public Accountants. All information included in these financial statements is the representation of the management of the International Association For Mathematical Geology.

A review consists principally of inquiries of company personnel and analytical procedures applied to financial data. It is substantially less in scope than an examination in accordance with generally accepted auditing standards, the objective of which is the expression of an opinion regarding the financial statements taken as a whole. Accordingly, we do not express such an opinion.

Based on our review, we are not aware of any material modifications that should be made to the accompanying financial statements in order for them to be in conformity with the cash basis method of accounting.

As described in the significant accounting policies of the notes to financial report, the accompanying financial statements are prepared on the basis of cash receipts and disbursements, except as described in Note C of the Notes to Financial Statements. This report does not include a statement of cash flows. These statements are not intended to present financial position and results of operations in accordance with generally accepted accounting principles

signed: Serr, Shanks, Stumm & Hollis

May 8, 1995

INTERNATIONAL ASSOCIATION FOR MATHEMATICAL GEOLOGY

BALANCE SHEET -- CASH BASIS December 31, 1994

CURRENT ASSETS	
Cash in checking	\$ 3,056
Cash in money market accounts	93,854
	96,910
OTHER ASSETS	
Investments - at market value	
U.S. government securities	
laddered trust	74,687
Short-term world income bond trusts	14,659
U.S. Treasury notes	69,373
Tennessee Valley Authority Bonds	12,496
GNMA unit trust accumulation program mutual fund	3,060
GNMA series E securities mutual fund	287
GNMA series J securities mutual fund	240
	174,802
TOTAL ASSETS	\$ 271,712
LIABILITIES	--
FUND BALANCE	
Balance at beginning of year	237,252
Net unrealized gain (loss) during the year on non-current investments - see accompanying note	(13,569)
Excess (deficit) of revenue over expenses, for the year	48,029
Balance at end of year	271,712
TOTAL LIABILITIES AND FUND BALANCE	\$ 271,712

INTERNATIONAL ASSOCIATION FOR MATHEMATICAL GEOLOGY

STATEMENT OF REVENUE AND EXPENSES -- CASH BASIS December 31, 1994

GROSS REVENUE	
Membership dues and monograph orders	\$ 38,343
Meetings	12,849
Publications - sales and fees	18,426
Royalties from publishers	54,776
Interest income	
Checking and money market accounts	2,842
U.S. Treasury notes and bonds	6,846
Short-term world income funds	2,527
GNMA-series E, J, and accumulation trust	282
Gain on sale of mutual funds	500
Other income	135
	137,526
GENERAL AND ADMINISTRATIVE EXPENSES	
Journal subscriptions and membership dues	34,822
Monograph orders	3,047
Travel expenses	6,828
Meetings (Mt. Tremblant and Prague)	12,433
Grants	300
Journal of Nonrenewable Resources (start up)	19,488
Membership promotion	2,435
Postage	1,308
Supplies and printing	1,742
Computer - for IAMG	2,528

Newsletter	2,903
Legal and accounting	590
Investment expense and bank charges	1,028
Eastern Treasurer expense of prior year	45
	89,497
EXCESS (DEFICIT) OF REVENUE OVER EXPENSES	\$ 48,029

INTERNATIONAL ASSOCIATION FOR MATHEMATICAL GEOLOGY

NOTES TO FINANCIAL STATEMENTS

INITIAL INCORPORATION, OPERATIONS AND PURPOSES

The International Association For Mathematical Geology, an unincorporated organization, was formed on August 22, 1968, as a non-profit organization, operated exclusively to promote international cooperation in the application and use of mathematics in geological research and technology.

NOTE A - SIGNIFICANT ACCOUNTING POLICIES

Cash basis statements

The accompanying statements have been prepared on the basis of cash receipts and disbursements, except as described in Note C of the Notes to Financial Statements. No provision has been made for receivables and payables other than those which have been generated by cash transactions. Therefore, the statements do not present financial position and results of operations in accordance with generally accepted accounting principles.

NOTE B - INCOME TAX

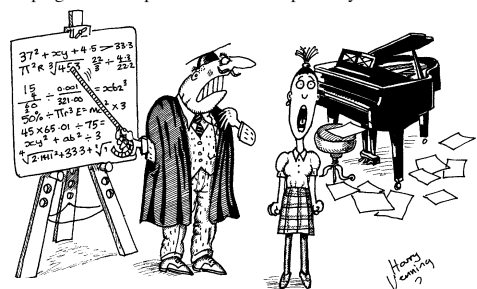
During 1990 the Association applied for and was granted exemption under Section 501(c)(3) of the Internal Revenue Code. During 1994 and 1993, none of its activities were unrelated to its exempt purposes. It is, consequently, not subject to the unrelated business income tax on tax exempt organizations. Contributions to the Association may be deducted, by the donor, as charitable contributions.

NOTE C - INCREASE IN FUND BALANCE - UNREALIZED GAIN ON SECURITIES

The investments in securities, included in other assets, are stated at the lower of cost or market. During 1994 the investments decreased in value by \$16,054. At December 31, 1994 the market value of the investments was \$15,140 less than original cost.

WESTERN TREASURER'S COMMENTS - 1994 FINANCIAL STATEMENT

- The accounting policy of stating the value of financial assets at the minimum of cost or market value is used to avoid the possibility of overstating the value of the assets. Assets of this type are actually kept on the books at cost. But if the market value is significantly lower than cost, a statement of value at cost would be misleading. The actual difference between market value and cost of securities is given in Note C of the financial statement.
- It is worth noting that the unrealized gain (loss) on securities is exactly that - unrealized. I have invested only in bond trusts or in the actual bonds themselves. If interest rates rise, the present value of bonds drops - indicating a loss in value, which becomes realized only if the bonds are sold before maturity. If the bonds are held to maturity the face value is received, and there is no realized loss. Bond mutual funds can be forced to sell bonds before maturity - thereby realizing the loss, but laddered trusts are fixed portfolios of bonds which are to be held to maturity. The bonds and bond trusts held by the IAMG were not bought at the original issue auction but were purchased at prices very near face value, and hence if they are held to maturity the IAMG will realize little gain or loss. This gain or loss was incorporated into the decision to purchase the bonds by looking at the "yield to maturity" calculated at the time of purchase.
- The accounting firm performs a "review", not an "audit", of the IAMG financial statements. An audit is a significantly more thorough examination of all aspects of an organization, including a physical inventory of assets and tracking of cash flows. It is also much more expensive than a review. A review, however, is not an insignificant matter and involves examination of the treasurer's books and accompanying statements from financial institutions involved in the handling of assets.
- In regard to the accountant's "Note A", I keep the books for the society on a cash basis rather than an accrual basis. The money is recorded in the books at the time it is actually received or spent rather than being entered in such a way as to reflect the time an obligation was incurred. In the case of the IAMG this makes a difference only in cases when (say) 1995 dues are received late in 1994 or when the bill for an item purchased in 1994 is not received until 1995. The cash basis can thus skew the income and expense statement slightly from year to year, but in the long run the values are properly reflected in the statements. Changing to the accrual method of accounting would make the bookkeeping more complicated and would probably necessitate the



The Singer 1995 395



Recent Books of Interest

Structural Geology and Personal Computers, ed. Declan G. De Paor.

Pergamon, 1996

Multivariate Geostatistics by Hans Wackernagel (Fontainebleau). Springer-Verlag, 1995, 256 pp.

Milankovitch Sea-Level Changes, Cycles, and Reservoirs on Carbonate Platforms in Greenhouse and Icehouse Worlds by J. F. Read, Ch. Kerans, L. J. Weber, J. F. Sarg, and F. M. Wright. SEPM Short Course Notes 35, 1995

Fractal and Non-Linear Dynamics: New Numerical Techniques for Sedimentary Data by Gerald V. Middleton, R. E. Plotnick, and D. M. Rubin. SEPM Short Course Notes 36, 1995

Graphic Correlation by Keith Mann and H. Richard Lane. SEPM Special Publ. 53, 1995

Geochronology, Time Scales, and Global Stratigraphic Correlation by W. A. Berggren, D. V. Kent, and J. Hardenbol. SEPM Special Publ. 54, 1995

Artificial Intelligence in the Petroleum Industry: Symbolic and Computational Applications 1, edited by Bertrand Braunschweig & Ron Day, paperback, 480 pages, 185 figures, 680 FF. Editions Technip, 27 Rue Ginoux 75737 Paris CEDEX 15, France, 1995

The Data Analysis Handbook by I. E. Frank and R. Todeschini. Elsevier, 1994, 384 pp.

Geostatistics for the Next Century, ed. Roussos Dimitrakopoulos. Ser. Quantitative Geology and Geostatistics 6, Kluwer Acad. Publ., \$194, 1994, 524 pp.

Climate Model Applications in Paleoenvironmental Analysis by Eric J. Barron and George T. Moore. SEPM Special Publ., 1994, 344 pp.

Member News

Donald McIntyre has received the *Kenneth E. Iverson Award* from ACM, the Association for Computing Machinery. It was presented to him at APL95, the International Annual APL Conferences held in Antwerp in 1994.

The Award includes a check for \$1,000 and a plaque reading: "The Kenneth E. Iverson Award for outstanding contribution to the development and application of APL". The Award was first made in Washington in 1983, and it has been given each year since, except for 1992.

Kenneth Iverson used what was then called "Iverson Notation" to give a formal description of IBM System/360 in the IBM Systems Journal, April 1964. This notation was later implemented and it is widely used in commercial work. Iverson has created a new dialect of APL, which he calls J, as an Executable Mathematical Notation. J is of great interest for those who are not content to use only spreadsheets and packaged programs.

Donald McIntyre used APL for the AGI/CEGS Short Course, "An Introduction to Mathematical Geology: Models of Geologic Processes", at the GSA Meeting in Philadelphia in 1969. The Short Course Lecture Notes were published by AGI. He has been a Distinguished Lecturer for ACM (1985-1990). His paper, "Language as an intellectual tool: From hieroglyphics to APL", was included in the IBM Systems Journal, vol 30, No. 4 (1991), a special issue commemorating the 25th anniversary of

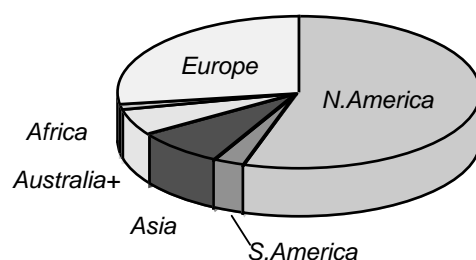
APL as an implemented language. He has published seven other papers on J (with 2 more in press), and given workshops on APL and J in Sweden, Switzerland, the U.K., China (People's Republic), and throughout North America.

John Harbaugh spent the last academic year as a visiting faculty member at Colorado School of Mines. He is now back at his old home base Stanford U. and has put in a bid

Looking at the **IAMG membership distribution** by country is like a trip around the world. As of November 1995 there were 549 members in good standing from 52 different countries. Well, depending on your political point of view it may be only 49 different countries. North America with USA and Canada dominate in membership, followed by Germany and Australia. China shows only 7 members but is actually more highly represented with an additional 23 corresponding members.

United Kingdom	8	Venezuela	1
England	11	Bolivia	1
Wales	1	Brazil	6
Scotland	3	Peru	1
Denmark	3	Argentina	4
Norway	5	Chile	2
Sweden	7		
Finland	2	South Africa	7
Belarus	1		
Ukraine	1	Australia	29
Turkey	2	Fiji	1
Bulgaria	1	New Zealand	1
Hungary	2		
Poland	1	Guam	1
Czech Republic	5	Philippines	1
Austria	5	Indonesia	2
Switzerland	6	Japan	10
Germany	35	Korea	3
Netherlands	9	China	7
Belgium	4	R.O.C.	3
France	8	India	7
Italy	10	Pakistan	1
Spain	17	Bahrain	1
Portugal	4	Kuwait	1
		Saudi Arabia	1
USA	245	Oman	1
Puerto Rico	1	Israel	3
Canada	53		
Mexico	4		

IAMG Membership Nov. 1995



IGBA, the IGneous petrological data BAse

contains a wide range of information: geographical, geological, chemical, age, petrological, mineralogical and other. The database was originally constructed by Felix Chayes and his coworkers. The latest, enlarged and corrected version, named IGBADAT v. 5.1 was compiled by J. L. Brändle and G. Nagy and contains 19519 specimen descriptions in 1066 data sets. Anybody is free to use it for scientific purposes; the user will find a lot of data published in different countries in different languages that have been collected by contributors familiar with the local geology or geological literature of the respective country.

The data and reference files, necessary descriptions and FORTRAN programs to facilitate utilization of the base are available as standard ASCII files. The base is available on magnetic media and, recently, by computer network (Internet). It can be picked up via ftp:

```
ftp olmo.csic.es
login username: anonymous
password: userid
cd pub/igneous
readme.txt (16153 bytes)
structur.txt (1443231 bytes)
igba.zip (1683193 bytes) compressed file (zip)
```

The zip files can be uncompressed with an unzip program on PC or Unix, or with ZipIt on Macintosh.

Unfortunately, the data base is far from complete, or even representative, considering the large quantities of data published. Updating and extension is continuing in the framework of the IUGS (International Union of Geological Sciences) Subcommission on Petrological Data Bases. New volunteer contributors - who are willing to work for the good of science - are welcome.

You can contact the coordinators via e-mail: igelb01@pinar1.csic.es) or brandle@eucmax.sim.ucm.es (Brändle, Jose) and h4077nag@ella.hu (Nagy, Geza)

Reference: Brändle, J. L., and Nagy, G.: The state of the 5th version of IGBA: Igneous Petrological Data Base. Computers & Geosciences v.21, no.3, 425-432 (1995)

Your ad or letter here!

contact your editor at:
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