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AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS

NEWSLETTER

Preview No. 6 Sept.-Oct. 1986

*** NEWSFLASH ***

Due to the overwhelming response of both the 'Call for Papers' and the 'Call for Exhibitors', the Conference Committee for the 5th Biennial Conference and Exhibition - Perth '87 has been forced to move to a larger venue.

The new venue is Observation City, a large new complex built for the Bond Corporation on the beach overlooking the America's Cup course at Scarborough a short distance from the centre of Perth.

This impressive international resort offers a wide range of suites and recreational facilities, while the conference and exhibition catering fully meets the Committee's requirements.

You really have no choice - see you in

PERTH '87

P.O. BOX 44, EASTWOOD, S.A. 5063

ASEG CONFERENCE UPDATE

As outlined in our NEWSFLASH, the Conference Committee has chosen Observation City as the new venue for the Perth Conference. The Committee has been deliberating the move for some time, following the response to the 'Call for Papers'. This was nearly a 70% increase on the Sydney Conference. The replies to date from the 'Call to Exhibitors' have forced the Committee to accept the inevitable. When the original venue was booked in March 1984, it was not anticipated that we could continue to build upon the success of the 1983 Brisbane Conference to such a degree. Through Brisbane 1983 and Sydney 1985 the ASEG Conference has grown to be a major national and international meeting. The interest, both from Australia and overseas, indicates that Perth will be the biggest conference so far.

The move to Observation City will ensure that more papers can be accomodated into the programme, which is already one day longer than the previous conferences. Exhibition space will also be larger, although it is expected that competition for the extra spaces will be keen.

Observation City is being built by the Bond Corporation for the America's Cup. As can be expected, it is a first-class venue which will ensure the success of both Conference and Exhibition.

Greg Street
Co-Chairman Perth-87

SPONSORS OF THE CONFERENCE

Horizon Seismic Australia
CRA Exploration
Bond Corporation
W.A. Institute of Technology
Aerodata
Agnew Clough Ltd
Geophysical Services Inc.
Exploration Computer Services
Calibre Resources Ltd
Ashley Geophysics
Timmins Geophysics
Western Geophysical Co.
Hosking Geophysical
WAPET
Western Mining Corp.
P & V Geophysical Services
Exploration Consultants Ltd
Oil and Gas Aust. Magazine
Tesla-10
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Advanced Reprographic Serv.

NOTICE OF COMING EVENTS

1987 CSEG National Convention - 'Energy in Motion'.
May 12th - 14th; Calgary, Alberta.
Call for Papers: send abstracts to

Canadian Society of Exploration Geophysicists,
1987 Technical Committee,
501, 206 - 7th Avenue S.W., CALGARY, Alberta,

BRIGHT SPOT - MEMBER'S FORUM

The President reports:

'I recently received a letter from the Chief Geophysicist of BHP Minerals concerning the high cost charged by certain Government Departments for located data tapes for airborne surveys. His argument is that surveys of this nature are flown using taxpayers' money and that to charge high prices for raw data is discriminating. While BHP and other large companies might be able to afford it, he maintains, it is an impost on smaller groups to pay a government department high up-front money for public data'.

The issue is undoubtedly likely to raise strong arguments on both sides, and since healthy argument is a sign of vitality, ASEG members are invited to use these pages to vent their collective spleens.

STACKED PROFILES

In keeping with an approach to give background information on prominent members of the ASEG, we present profiles of Ken Howard and Stuart Brew. Ken and Stu were instrumental in obtaining a substantially discounted price on a PC for the Society's membership database (see last issue).

Kenneth W. Howard is currently Australia-New Zealand Exploration Manager, Sydney for Geophysical Service Inc. and International Vice President of the International Association of Geophysical Contractors. Married, with five children, Ken holds a BA degree from Texas Christian University (class of 1958). After service with Military Intelligence in Korea, Ken worked for Rayflex Exploration Co. and Chevron Geophysical from 1961-1964 before joining GSI in 1965. His first posting to Australia was from 1967 to 1973. He was elected a Vice President of GSI in 1975. After postings to Singapore, England and Dallas, Texas he returned to Sydney in 1986.

Ken is a member of ASEG, SEG and PESA.

Stuart Brew is currently Australia-New Zealand Land Processing Manager for GSI in Adelaide. Stuart graduated in 1969 with a BSc Honours degree in Physics and Mathematics from the University of Aston in Birmingham, UK. From 1969 to 1972 he worked for Petty Ray Geophysical in the UK, Libya, Nigeria and Senegal. He joined GSI in 1972 and has worked mainly in data processing in England and the Middle East. Before coming to Australia in 1985, Stuart was Site Manager and European Land Processing Manager in Croydon, England.

Married, with two children, Stuart is a member of ASEG and SEG.

INDUSTRY NEWS

Despite my plea in the last issue of 'Preview' for copy, I have received very little in the way of gossip and may be forced to start inventing some (see Call for Sponsors).

People:

*Dr. Greg Beresford-Smith has recently joined Lindsay Thomas in the Geophysics group at the University of Melbourne. His main research interests have concerned techniques for signal-to noise enhancement of seismic data with special emphasis on the suppression of dispersive surface waves. Geophysicists interested in research in seismic data processing are invited to contact Dr. Beresford-Smith in the Department of Geology.

*Terry Harvey has returned from a stint of 8 years or so in Saudi Arabia and consults in Adelaide.

*A recent review of contractors and consultants in South Australia by Terry Crabb has shown a 50% reduction in employees from 254 in January 1986 to 125 in July. The bulk of these are in cutbacks in seismic crews.

Companies:

*GSI closed its Perth Processing Centre in September and consolidated its seismic data processing operations into its Adelaide and Sydney centres. Marine Data Collection operations along with the Navigation and GPS systems remain in Perth at a new address:

Geophysical Service Inc.,
64 Buckingham Drive,
WANGARA WA 6026.

Telephone: (09) 409-6622
Facsimile: (09) 409-6433
Telex: AA93965

*The airborne and instrument sale operations of Geometrics International Corporation, a subsidiary of Geometrics Incorporated, operating in Australia has been purchased by the Kevron Group of Perth, Western Australia. Two new companies will be formed:

Kevron Geophysics Pty Limited based in Perth
Geo Instruments Pty Limited based in Sydney.

Kevron Geophysics will be responsible for airborne operations, while Geo Instruments will provide equipment for purchase or rental.

Familiar faces in Geo Instruments include Roger 'Tiger' Henderson as General Manager, Tim Pippett as Sales Manager and Zoltan Beldi as Chief Service Engineer.

OBITUARY HAROLD MOONEY

Harold M. Mooney, 63, Professor of Geophysics at the University of Minnesota, died on August 6, 1986 after a long battle with cancer.

Dr. Mooney was internationally known for his many contributions to geophysics. His publications spanned the range magnetics, gravity, self potential, electrical resistivity theory, earthquake seismology, seismic instrumentation, elastic wave theory, digital filtering, and engineering geophysics. He is probably best known for his three books on geoelectric sounding and his "Handbook of Engineering Seismology". He visited Australia on two occasions, in 1968 and 1981.

Hal graduated in physics from Harvard and after several years employment as an electronics engineer, went on to earn his M.S. and Ph.D. degrees in geophysics at Cal Tech under Beno Gutenberg. He came to the University of Minnesota in 1950, where he stayed until his retirement in June this year. He was consultant for several geophysical companies and spent a number of summer vacations employed by oil companies and seismic contractors.

Harold Mooney was highly regarded by his colleagues and students for the many excellent courses he developed and taught. He constantly updated his very impressive lecture notes which on last count occupied 16 huge volumes. During his career he supervised over 40 Ph.D. and M.S. candidates. I was fortunate enough to have been one of them. He was a brilliant, yet modest, man who had a profound impact on all who came to know him. The geophysics profession has lost one of its best scientists and educators.

Professor Mooney is survived by his wife, Dorothy, daughters Ruth Mooney of Minneapolis, and Kathy Grundy of Houston, Texas, and two grandchildren.

Stewart Greenhalgh

EMPLOYMENT AND SCHOLARSHIPS, ETC.

CSIRO

ELECTROMAGNETIC AND ELECTRICAL GEOPHYSICS

$42,906 - $48,734

DIVISION OF MINERAL PHYSICS AND MINERALOGY
NORTH RYDE NSW

GENERAL: The Division of Mineral Physics and Mineralogy conducts research in minerals and petroleum exploration within the CSIRO Institute of Energy and Earth Resources. A wide spectrum of scientific disciplines contributes to geophysical and geochemical research conducted in collaboration with the mining and exploration industry.

The Division is prominent in the development of exploration methods. New EM/IP equipment and field techniques integrated with computer interpretation methods are applied to mineral and hydrocarbon exploration. Time-domain EM developments have led to the commercial production of SIROTEM equipment. Application of this technology is being extended to map and monitor groundwater quality and to evaluate coal seam quality.

DUTIES: The appointee will lead and participate in the research and development of electromagnetic and electrical geophysical techniques for resource exploration. Future objectives might include EM/IP research as well as possible diversification to develop and introduce other geophysical methods. The successful candidate will be expected to liaise with industry in setting research goals, arranging project funding, and in the transfer of new ideas and equipment into exploration practice.

QUALIFICATIONS: A PhD degree in geophysics or physics or equivalent qualifications supported by evidence of proven successful research experience. Demonstrated flexibility and the capability to provide senior research leadership is essential, as is the ability to work well with the exploration and mining industry.

TENURE: Indefinite with Australian Government superannuation benefits available.

For an exceptional candidate a more senior level of appointment may be considered.

APPLICATIONS: Stating relevant personal particulars including details of qualifications, publications and experience together with the names of at least three professional referees. Before submitting a formal application, interested applicants may wish to contact the Chief of Division and/or visit the Division. Formal applications quoting reference No. A3918, should be directed to:

The Chief
CSIRO Division of Mineral Physics and Mineralogy
PO Box 136
NORTH RYDE NSW 2113

by 7 November 1986

AB1-HS40/1

CSIRO IS AN EQUAL OPPORTUNITY EMPLOYER

WAIT Western Australian Institute of Technology

Applications are invited from suitably qualified women and men for appointment to the following position:

Tenured Lecturer
GEOPHYSICS

The Department of Geology and Geophysics specializes in the training of exploration geophysicists and geologists to PhD level. The Bachelors degree course gives a broad training in all major exploration areas. Specialization in oil exploration geophysics is available and specialist mineral exploration geophysics is under development at postgraduate level.

The appointee will be required to lecture and conduct practical work in all basic areas of geophysics as well as to contribute to the advanced programmes and thesis research supervision. Field experience in electromagnetic techniques is preferred. (Ref 933)

Salary Range: Lecturer $27,859 - $36,600;

Conditions include fares for appointee and family plus assistance with removal expenses.

Applications: Details including the names, addresses and telephone numbers of three referees should be submitted not later than 7 November to the Appointments Officer, Western Australian Institute of Technology, Kent Street, Bentley, WA 6102, from whom further information on duties and conditions may be obtained. Telephone enquiries to Dr W Walker (09) 350 7510.

When applying please quote Ref No and Code AUI.

WAIT IS AN EQUAL OPPORTUNITY EMPLOYER

Macquarie University

SCHOLARSHIPS IN EXPLORATION GEOPHYSICS

POSTGRADUATE SCHOLARSHIP

Macquarie University is currently offering a postgraduate scholarship in exploration geophysics, to enable the holder to undertake a research project within the scope of the Centre for Geophysical Exploration Research leading to the degrees of MSc(Hons) or PhD. The scholarship will be tenable initially for one year with provision for renewal for up to a further two years, and will have a stipend of $A11,500 p.a.

Applicants should hold at least a first class honours degree (or equivalent) in Geophysics, Physics, Mathematics, Geology, Electrical Engineering or a related discipline.

HONOURS SCHOLARSHIPS

Scholarships are also available for undergraduate students who wish to enrol as Honours candidates at Macquarie University in 1987, to carry out research under supervision within the Centre for Geophysical Exploration Research. Applicants should hold or expect to hold, a B Sc in Geophysics or a related field, and must have satisfied the University's entry requirement for full-time Honours candidature.

Each scholarship is valued at $500. It is expected that successful applicants will commence work on their research project during the University's long vacation (January-February 1987). During this period it is also hoped to give award holders work experience in industry for which some additional remuneration may be possible.

General

The Centre incorporates the exploration geophysics activities of the School of Earth Sciences of the University, the CSIRO Division of Mineral Physics and Mineralogy, and the NSW Department of Mineral Resources. Major research areas are: seismic processing, modelling and interpretation; high resolution reflection seismology; natural and applied field electromagnetics; complex resistivity on the surface and in boreholes; marine seismic studies; palaeomagnetics; database and interpretation for Magsat and Landsat; and processing, modelling and inversion of electrical EM and seismic refraction data. A Centre brochure is available on request.

Applications close 24 October 1986. Those interested should contact the Director, Centre for Geophysical Exploration Research, Macquarie University (telephone (02) 88 9220). Application forms are available from the Registrar, Macquarie University, North Ryde, NSW 2113 (telephone (02) 88 9555 for postgraduate scholarships, or (02) 88 9321 for Honours scholarships).

—94796

IUGS UNESCO

INTERNATIONAL GEOLOGICAL CORRELATION PROGRAMME

CALL FOR APPLICATIONS FOR FUNDS

The Australian Government through the Bureau of Mineral Resources has allocated $20 000 as a Grant-in-Aid to assist Australian geoscientists who are actively involved with IGCP projects.

The purpose of the grant is to promote Australian involvement in IGCP through the hosting of, or participation in, conferences/workshops/seminars either in Australia or overseas.

Selection Criteria

1. *Highest priority will be given to Australian geoscientists who can demonstrate active involvement in IGCP.*

2. *Financial assistance may be provided towards the cost of convening an IGCP conference in Australia, or as a contribution towards expenses of Australian geoscientists to participate in IGCP symposia overseas.*

3. *Clear evidence must be provided of a strong and effective scientific programme whereby the objectives as they relate to Australia can also be seen to be contributing to international science, especially in developing countries.*

4. *Activities must be scheduled so that the funds provided are expended in the calendar year 1987.*

Applications

If you have a proposal which meets these criteria, please submit it before 30 January 1987, to:

The Senior Executive Officer, Natural Sciences,
Australian National Commission for UNESCO,
PO Box 826,
WODEN ACT 2606

Should you have a general inquiry about your application, please contact Dr Colin Branch, Chairman, Australian IGCP Committee, on (08) 274 7637.

Australian Academy of Science

ELIZABETH AND FREDERICK WHITE RESEARCH CONFERENCES

With the generous support of Lady Elizabeth White MB BS, and Sir Frederick White FAA, FRS, the Academy has established a series of research conferences in the physical and mathematical sciences related to the solid earth, the terrestrial oceans, the earth's atmosphere, solar-terrestrial science, space sciences and astronomy. The purpose of the conferences, called the Elizabeth and Frederick White Research Conferences is to advance at the most fundamental level the understanding of the chosen subject, to endeavour to introduce to Australian research new aspects or directions not hitherto undertaken and to encourage participation of overseas scientists in the conferences. The conferences are intended to fill in Australia part of the niche filled by the Gordon Research Conferences in the United States.

Up to two conferences are organized each year, with a membership of 20-30, and of about 2 days duration. The conferences are held in the Academy's Ellerton Becker Building in Canberra at a date agreed upon by the conference organizer and the Academy. Each year the Academy issues invitations to relevant scientific organisations and societies to propose topics for these Conferences.

Proposals should include the following information

1. A tentative programme, with the names of possible participants.

2. A brief statement concerning the aims, value and timeliness of such a programme, including an indication of support from the local scientific community and of the importance of the programme for Australian science.

3. The names of two joint organisers

4. A proposed budget.

and will be on a form which will be supplied by the Academy Secretariat on request.

The organisers of approved conferences are responsible for the detailed arrangements, and the organisation/society acting as joint sponsor receives and is accountable for the sum allocated for the meeting, up to $5,000 for each conference. The supplementation of this sum from other sources is encouraged.

The Academy now cordially invites organisations and societies to prepare proposals for meetings in 1987. They should reach the Executive Secretary by the 15 November 1986. Organisations and societies intending to submit proposals should give preliminary notice to the Academy immediately.

All organisations and societies will be advised of the successful proposals in December.

Telephone enquiries: (062) 47 3966
Mrs Hilary Beck

GPO Box 783, Canberra ACT 2601, Australia

AUSTRALIAN GEOSCIENCE SOCIETIES

Dear Editor,

I have been asked by the Federation of Australian Scientific and Technological Societies to compile a list of significant studies in Australian geoscience. To obtain a comprehensive overview I need contributions from a large number of people, so I appeal to your readers to assist me.

I would appreciate ideas on which studies carried out by past and present Australians (preferably in Australia), are of national and particularly international significance.

It would be helpful if items could be categorised as they relate to:

a) study and use of Australian resources

b) contributions to world knowledge

c) activities facilitating interaction with the world-wide scientific community.

For each item please provide one or two key words to indicate the field of study (e.g. petroleum genesis; large dams), then in a few lines explain the scope and importance of the study, name who was involved and when, and indicate any institutional affiliation.

Your cooperation in this project will ensure that the geoscience sector is properly represented amongst the other sciences.

Colin D. Branch,
C/- Department of Mines and Energy,
PO Box 151,
EASTWOOD SA 5063

The Australian Geoscience Council:

General Aims

1. Dissemination of information about the Earth Sciences.
2. Advisory role in education in Earth Sciences in Australia.
3. Provide Government and the public with information on the Earth Sciences.

Current Activities

1. Involvement with Tertiary Education in Geosciences and in particular inter-relationship with Commonwealth Tertiary Education Commission. A workshop was organised in November and a follow-up workshop will be held in August 1987. One concept that arose from this workshop was the proposal for key centres of learning.

2. A survey of employment in Geosciences (recent publication of Human Resources Report).
3. The AGC is an umbrella organisation representing Australian geoscientific societies (ASEG is represented on the Board), e.g., AGC represents ASEG, GSA, PESA, etc. on the Federation of Australian Scientific and Technical Societies (FASTS).
4. The production of an annual report describing the activities of 30 Earth Science disciplines.
5. Co-ordination of conferences.

TECHNICAL UPDATE

GPS surveying for the Earth sciences

(reprinted with permission from BMR Research Newsletter 3)

The Global Positioning System of satellite geodesy (GPS) will enable geophysicists to accurately survey most of their own fieldwork with significant savings in exploration costs. Other applications of GPS in the Earth sciences offer widespread benefits to both exploration and research. A report 'Geodetic measurement of crustal deformation in the Australian region' was recently submitted to th Australian Academy of Science by a Working Party of the National Committee for Solid-Earth Sciences. This report emphasises the advantages of implementing a vigorous program of geodesy using space technology - GPS, Very Long Baseline Interferometry (VLBI) and Satellite Laser Ranger (SLR) - for scientific purposes in Australia. The report also clearly shows that applications of GPS would provide greater accuracy to surveying and navigation if tracking and base stations were set up.

By the end of the eighties, GPS applications in BMR are expected to provide:

- real-time navigation of vehicles, ships, and aircraft to an accuracy of tens of metres;
- determination of latitude, longitude, and elevation of geophysical field survey stations on site to an accuracy of less than 1 m equivalent in just a few minutes;
- precise geodetic measurement of crustal deformation to within a few centimetres.

GPS is intended primarily as a real-time navigation system for military and civilian purposes. Data broadcast by the GPS satellites for precise real-time navigation (the Precise or P code) are of strategic importance that they are likely to be encrypted and their use restricted to military or selected civilian users when the full constellation of 18 satellites is in orbit in 1988. Other data broadcast by the GPS satellites are capable of giving less accurate navigation (the Coarse/Acquisition, Clear Access, or C/A code), and will continue to be freely available. Various GPS receivers use one or other of these codes to determine point positions, but other receivers measure the phases of the broadcast

CALL FOR PAPERS

We call for papers which embrace the conference's theme of persistence, through application and integration of all methods and attention to detail .... in the words inscribed after Cook's death

"leaving nothing unattempted"

To be part of our Voyage of Discovery submit your papers now to

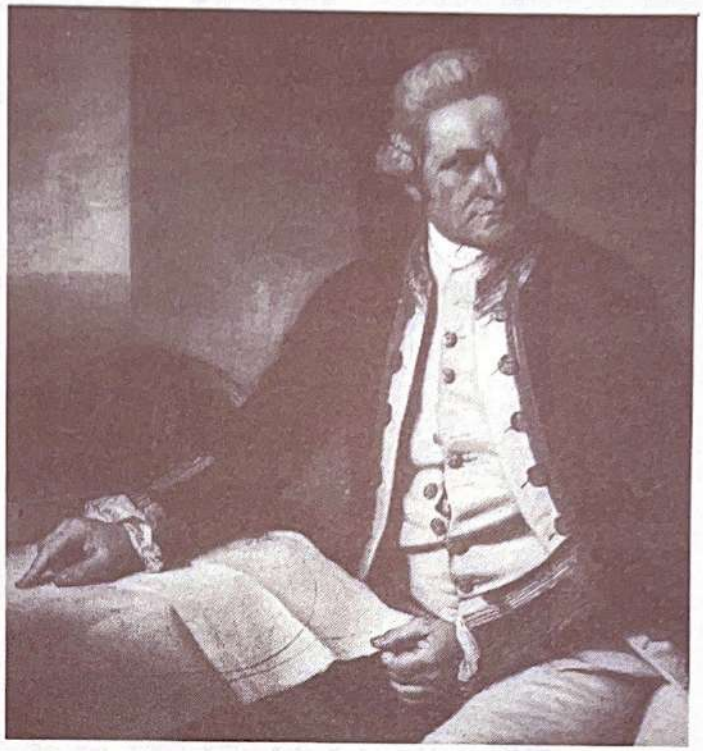
1988 SEG/ASEG
Technical Papers Committee,
P.O. Box 44,
Eastwood,
South Australia

"For me .... to have quit .... would have been betraying not only a want of perserverence, but judgement, in supposing the South Pacific Ocean to have been so well explored that nothing remained to be done in it."

CALL FOR PAPERS

".... leave nothing unattempted ...."

(Captain James Cook, R.N.)



A UNIQUE OPPORTUNITY

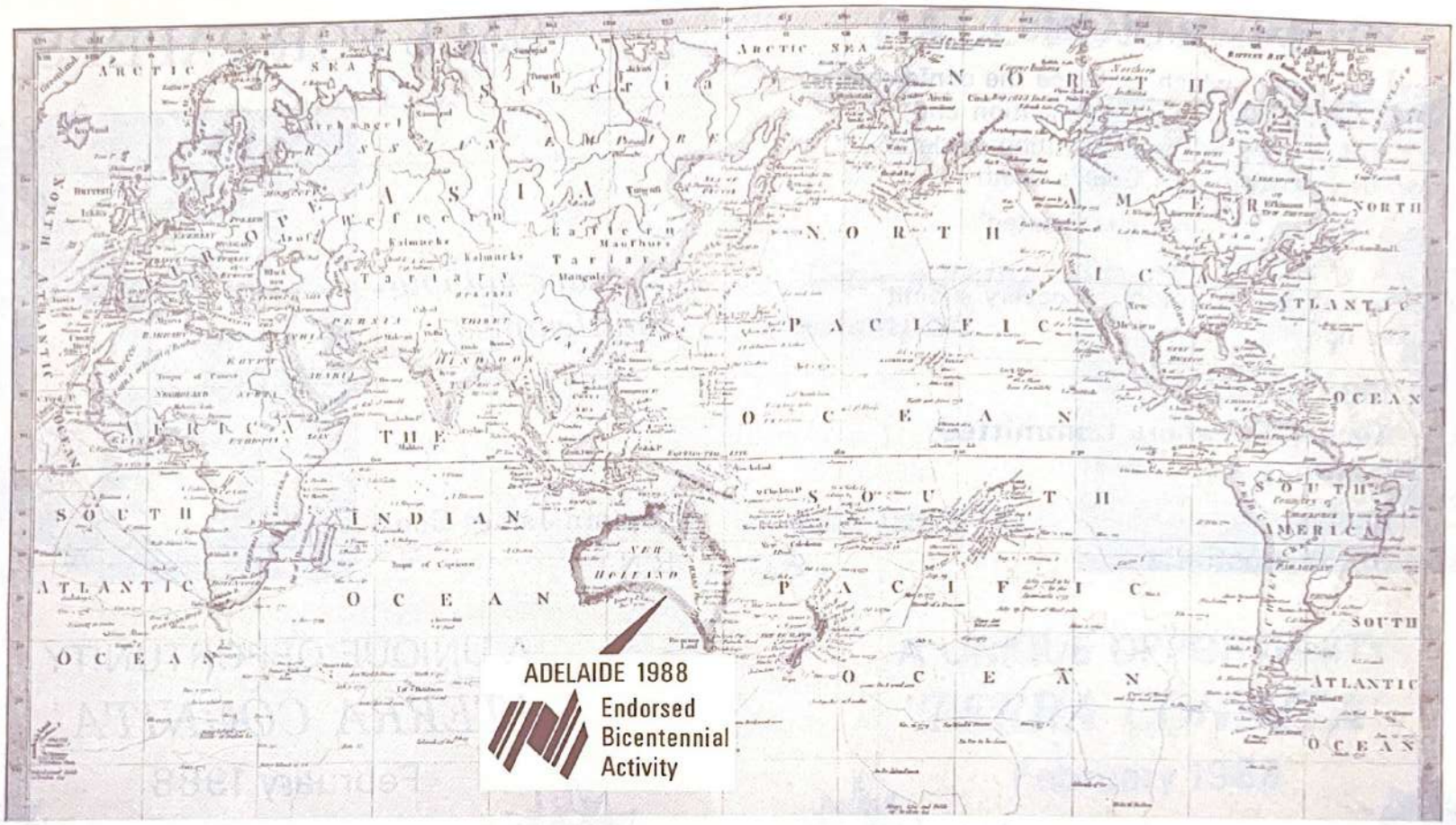
'TERRA COGNITA'

February 1988

SEG / ASEG

INTERNATIONAL GEOPHYSICAL CONFERENCE & EXHIBITION

ADELAIDE, AUSTRALIA



VOYAGE OF DISCOVERY

From Hawaii to Vancouver, from Tahiti to New Zealand, to the Great South Land–Australia and its Great Barrier Reef, Captain Cook's magnificent voyages of exploration are an inspiration to all modern day explorers.

The SEG and ASEG invite you to participate in a modern voyage of discovery to the South Pacific Ocean and Australia, to Adelaide and the start of the Great Australian Outback Experience.

carrier waves, and do not require a knowledge of either code to determine by Doppler the most precise geodetic positions.

At present, seven satellites are in orbit, and six of them have atomic clocks so that they are suitable for use with all GPS receivers. Their orbits are such that the satellites cluster over the USA for test and survey purposes for some hours each day, and fortunately for us they also cluster over Australia. The availability of the P code and satellite ephemerides has enabled GPS measurements using different types of receivers to be made for survey and research purposes overseas; some measurements are now being made in Australia.

The accuracy and speed of measurement using GPS make it far superior to its predecessor, the Transit Doppler system. As with Transit and other satellite systems, GPS will be usable day and night in all kinds of weather, and does not require visibility between survey points because surveying is ground-to-sky at each point. Simultaneous measurement of distances to multiple GPS satellites leads to effective cancellation of receiver clock errors, considerably improving the accuracy of point-positioning of a single receiver. The full constellation of 18 satellites in six near-circular high-inclination orbits will provide mutual visibility of at least four satellites from almost anywhere in the world at all times. Their high altitude (20 200 km) will improve baseline measurement accuracy, and substantially reduce atmospheric drag errors in the ephemerides which give the locations of the satellites in space. Forecast ephemirides are broadcast by the satellites, and more accurate post--processed ephemirides are available later. If, as has been recommended, Australia installs a regional tracking network higher-accuracy forecast and post-processed ephemirides will have guaranteed availability. Relative positioning of a field receiver to a fixed base cancels errors in the satellite clocks, as well as those in the receivers and over moderate distances reduces errors caused by tropospheric and ionospheric refraction; this technique provides the highest precision in GPS surveying.

Although four satellites are normally used to position a point, this requirement can be reduced to three, either by attaching a cæsium or rubidium atomic clock to the receiver - e.g., at the height above sea level of the masthead for a shipborne receiver. Two satellites are adequate when the receiver has both an atomic clock and fixed antenna altitude; windows with two satellites visible already total 17 hours per day in Australia.

Surveying accuracies are usually specified in parts per million (ppm), commonly with a minimum error limit. Navigation of ships requires accuracies of 10-100ppm, equivalent to 10-100 m in 1000 km. The same order of accuracy is adequate for horizontal coordinates for regional geophysical surveys (1-10 m in 100 km), but the vertical accuracy for some surveys - e.g., gravity - must be better. Crustal deformation

studies seek accuracies of 0.01-0.1 ppm with centimetric accuracy between Australia and Antarctica and millimetric accuracy across the Southwest Seismic Zone. If these higher accuracies can routinely be obtained, then GPS can supersede, on the basis of cost, terrestrial geodetic techniques over shorter distances for any detailed or semi-detailed survey. Raw GPS accuracies are better than 10 ppm, and the more effective surveys achieve an accuracy of 1 ppm. Research indicates that 0.1 ppm with centrimetric precision will soon be achieved; that 0.01 ppm with millimetric precision will be accomplished in the longer term; and that corrections necessary for removing systematic errors in order to ensure accuracies of the same orders could be determined.

Gravity data obtained and compiled by BMR contribute to determinations of (1) accurate GPS orbits, particularly corrections applicable to the Australian region, and (2) the shape of the geoid in order to evaluate geoid-spheroid separations. These separations must be evaluated precisely if they are to be used for calculating precise heights above mean sea level from the ellipsoidal heights given by GPS. BMR has commenced research into ways of determining the shape of the geoid more accurately in cooperation with several other institutions with geodetic interests.

The rate of introduction of GPS into Australia will accelerate rapidly as the present high cost of receivers reduces dramatically over the next few years. User groups have been meeting in the ACT/NSW and Queensland regions for some months, and the National Mapping Council is setting up a committee to consider GPS. Examples of GPS surveys completed or planned this year include navigation of geophysical survey vessels and aircraft, surveying of power lines, location of geophysical field stations and of oil rigs, and first-order geodetic surveying at the State and Federal levels.

For further information, contact Brian Barlow at BMR.

GEOPHYSICAL STANDARDS

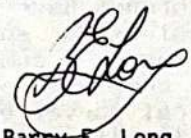
All geophysicists should be aware of Barry Long's standards.

Mr. R. Nelson,
Newsletter Drone,
ASEG Executive
P.O. Box 44
EASTWOOD SA 5063

Dear Drone,

Please find attached a copy of the index of some material sent to myself from the SEG in my capacity as standards representative in Australia. Thought perhaps it could be noted in the newsletter and if anyone requires a copy they could contact myself.

Yours industriously,



Barry E. Long
ASEG Standards Worker

Seismic Subroutine Standard

submitted to the

Society of Exploration Geophysicists

Technical Standards Committee

May, 1986

by the Subcommittee on Seismic Subroutine Standards

R. R. Read
M. J. Castleberg
J. R. Chalfant
G. W. Francis
J. T. Horn
J. Pizante
C. W. Racer
J. B. Vallhonrat

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 SCOPE OF THE STANDARD

This document defines a standard library of subroutines useful for seismic signal processing. The name, the order and definition of parameters, and subroutine functionality are defined. Actual code is not defined.

1.2 BENEFITS

The benefits of a standard library for seismic signal processing are: (1) better performance of seismic programs on different types of computers since the routines can be optimized for the computer; (2) portability of seismic applications to newer and faster computers as they become available with standard library support; (3) easier interchange of seismic programs.

1.3 LIMITS

This document is not a user manual or a reference manual. Input-output is not considered. It assumes that the reader is familiar with signal processing, Fortran, and mathematics; hence, it will not attempt to explain the utility of the routines.

The standard includes only the operations used in one dimensional signal processing. Matrix operations and image processing operations are not included.

2.0 FORMAT

2.1 FORM FOR EACH ROUTINE.

Each routine will be presented by specifying a routine name and a list of parameters. On the same line will appear a brief description of the routine, for example, "dot product". A formula that describes the mathematical operation performed by the routine is given.

2.2 PARAMETERS

Most of the vector routines contain parameters of the following types: operands, vector strides, element counts, and processing flags.

2.2.1 Operands

Operands are typically scalars or arrays that contain real or complex input or output data. In the formula for each routine, the subscript for the first element in each array begins at zero and progresses in a direc-

. . . . . and so on.

GEOPHYSICS AT FLINDERS UNIVERSITY

The School of Earth Sciences at Flinders University offers undergraduate and graduate studies in Geophysics. The other areas of teaching and research activity are Meteorology, Physical Oceanography, Geology and Hydrology. The School emerged from Physical Sciences during the mid-1970's and retains many features which are unique in Australian Tertiary Education.

At present there are 8 Honours and 28 Ph.D./M.Sc. students enrolled in the School plus 3 post-doctoral research fellows. There are two teaching programmes in geophysics. One is designed for the "Explorationist" and combines geophysics, geology, mathematics and physics. The other programme, intended for students with a theoretical bent, gives greater emphasis to mathematics and physics. Both curricula include 10 separate courses in theoretical and applied geophysics.

The following academic staff are actively involved in the geophysics programme:

Dr. F. Chamalaun	(magnetic and EM methods, rock magnetism, palaeomagnetism, plate tectonics)
Dr. S. Greenhalgh	(elastic wave theory, digital signal analysis, seismic exploration, earthquake and crustal geophysics)
Prof. G.W. Lennon	(geodesy, earth tides, harmonic analysis)
Dr. C. Rao	(elastodynamics, synthetic seismograms)
Prof. C. von der Borch	(seismic interpretation, seismic stratigraphy)
Dr. M. Wegener	(remote sensing, satellite image processing)
Dr. A. White	(gravity and electrical methods, well logging, sea-floor magnetometry, geomagnetic induction)

Research facilities within the School are excellent. There are three large laboratories set up for geophysics research. A geophysical vault on a quiet section of the campus is used to monitor seismic and magnetic phenomena Calibration facilities for a wide variety of geophysical sensors are available. Scale model apparatus for seismic and electromagnetic experiments as well as geophysical field equipment are provided for student projects.

The School has 22 terminal lines to the University's Prime 9955 research computer. A large number of graphics terminals and printers, four plotters and a large digitising table are available within the School. In addition, the School has its own PDP minicomputer, complete with tape drive and cassette readers, and over 20 microcomputers which can be linked to the Prime mainframe computer. Extensive software has been developed in-house for seismic and magnetic modelling and processing.

There is an active development of micro-processor instrumentation. The School has well equipped Mechanical and Electronics Workshops. There are 12 skilled technicians, 3 computer systems officers, and a further 9 general support staff. The School has its own research craft, suitable for work in the South Australian Gulf and coastal waters, and its own fully-instrumented light aircraft.

Flinders University is a proven high achiever in the research area,

.../2

having consistently attracted record funds for research. Nearly all members of the academic staff in Earth Sciences received grants from ARGS and other bodies during 1986. Selected recent publications of geophysics staff deal with geomagnetic array studies in Java, India and South Australia, palaeomagnetism of the Banda Arc, electrical conductivity anomalies on Eyre Peninsula, vertical seismic profiling, channel wave imaging of faults in coal seams, theoretical seismogram computations, and seismicity and crustal structure of South Australia.

The School is closely involved with the University of Adelaide and the South Australian Institute of Technology in the recently established National Centre for Petroleum Geology and Geophysics. The Seismic Unit at Flinders is a collaborator, along with the Bureau of Mineral Resources and the South Australian Department of Mines & Energy, in the Sutton Institute for Earthquake Physics.

INTERESTING THINGS WHICH CAME IN AFTER I'D DONE COMING EVENTS

THE SPECIALIST GROUP ON SOLID EARTH GEOPHYSICS
FIRST CIRCULAR

2nd WORKSHOP ON AUSTRALIAN EARTHQUAKE MAGNITUDE SCALES

4 December 1986
School of Earth Sciences
Macquarie University, North Ryde.

The lst Workshop on Australian earthquake magnitude scales which was held in Canberra on 21 May 1982, identified some fundamental problems in reporting magnitudes for Australian earthquakes. It was decided at the meeting, to re-examine regional attenuation factors, and to derive amplitude as well as duration based magnitude scales for the Australian region.

Papers are requested from all the main seismological centres in Australia with accounts of progress made in the magnitude studies. The 2nd Workshop has been timed to follow the "Earthquake Engineering Symposium" on 2-3 December, 1986 at Milsons Point.

Presentations will last 20 minutes. A further 10 minutes will be allotted for question time at the end of each paper. The meeting will conclude with a Panel Discussion.

Intending speakers are invited to submit a summary up to 600 words by October 29, 1986 to:

Kevin McCue
Australian Seismological Centre
GPO Box 378
CANBERRA ACT 2601 Telephone 49 9675

The Workshop Proceedings will be published subsequent to the meeting as a BMR Record.

Mr. Bzzzz Nelson,
Newsletter Drone
ASEG Executive,
PO Box 44,
EASTWOOD SA 5063

Dear Bzzzz,

Please find enclosed some brochures for an international symposium on signal processing to be held at Queensland University next year. There is a geophysics section and there is probably some point to advising all local branches.

Hummingly yours,

Barry E. Long

ISSPA 87

1987 IASTED INTERNATIONAL SYMPOSIUM ON SIGNAL PROCESSING AND ITS APPLICATIONS

ISSPA 87 is the first international Symposium held in Australia devoted exclusively to Signal Processing and its applications. The Symposium aims to provide a forum where industrialists, researchers, engineers, and technicians may discuss common and disparate objectives and aspirations for the applications of Signal Processing.

AREAS OF INTEREST:

1. Digital Signal Processing
2. Spectrum Estimation and Modeling
3. Speech Processing
4. Image Processing
5. Underwater Acoustics, Geophysics, Oceanography
6. Digital Communications
7. Audio and Electroacoustics
8. Optical Signal Processing
9. Biomedical Signal Processing
10. Artificial Intelligence
11. Radar Signal Processing
12. Array Signal Processing
13. Detection, Estimation and Identification
14. VLSI for Signal Processing
15. Other Applications

EXHIBITION

An exhibition of equipment and technical apparatus related to the subject will be held in conjunction with the conference. Prospective exhibitors are invited to contact the Conference Secretariat to make preliminary arrangements.

CALL FOR SPONSORS

I sat back and waited to be inundated by a flood of people anxious to advance Australian geophysics (and themselves) by sponsoring the ASEG Newsletter. Alas, all is in vain. To date, only one organisation (which modesty forbids I name) has contributed. I am now prepared to resort to blackmail (see Industry News), so be prepared.

Bzzzzz.

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CANBERRA, 2600

Atten: Mr. M. Sexton