

International Association of Hydrogeologists
AUSTRALIAN NATIONAL CHAPTER

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NEWSLETTER

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THE FIRST 200 DAYS

A VIEW FROM THE IAH PRESIDENCY

Since the election at Beijing in August last year I have been actively learning, beginning tasks and seeing some accomplishments. The world is a pretty big place I am discovering but it is both challenging and fulfilling to have a go at creatively attempting to serve in some small way. The task is both exciting and at times quite demanding.

Soon after returning from China I engaged in communicating and establishing a new pattern of Regional Advisors. The new Council reached agreement that it would be helpful to have a person actively working as well as advising me and the Council on how to develop IAH in the major regions of the world. These are defined as:

- Australasia and the Pacific (Dr Charles Lawrence)
 - Asia (Professor Fei Jin)
 - North America (Dr Phil La Moreaux)
 - South America (Dr Emelia Bocanegra)
 - Europe (E) (Prof Dr Igor Zektser)
- Africa is covered by an existing Council member

Then in November it was off to San Luis Potosi, Mexico to the 3rd Congress of the Latin American Groundwater Association (ALHSUD). This was co-sponsored by IAH and I was given an opportunity to speak at the opening - in Spanish. Thanks to the assistance of our IAH colleague, Gabriel Salas who I specially want to publicly thank. He voluntarily helped considerably with translation and pronunciation both prior and during the conference. Gabriel wrote about the conference in the November Newsletter (4). During the Congress I was able to develop some relationships with various leaders of National Groups. I was able to attend an executive meeting and encourage the Argentinian National Group of IAH, which is the largest in South America. Several new National Groups are likely to flow; Chile and Colombia. About 100-160 new members are also likely to join IAH. The relationship between IAH and ALHSUD is very strong and we plan more joint meetings in the future.

January, apart from being beach and holiday month provided some relaxing time to get my thoughts and ideas together ready for the IAH Executive held at Kenilworth (Birmingham) UK, February 7 - 9. This includes clarifying our IAH mission and strategies to fulfil the vision. Another more basic task has been to see if our constitution is appropriate for the task ahead into the next century.

The Executive agreed that a revised draft Constitution would be presented to the General Meeting of IAH at Nottingham.

Another task was to review the IAH Congress being proposed in the future. This process extends out to 2002 with a progressive roll out as the years go on. In summary the bids that are confirmed or are firming up include:

IAH Congresses:

- Nottingham September 21 - 27, 1997

- Las Vegas September 27 - October 2, 1998
- Bratislavia (Slovakia), 1999
- South America 2000 - October probably

Joint Meetings

- Athens (Greece) June 23 - 27, 1997 with IAEG¹
- Montevideo (Uruguay), 1998 with ALHSUD
- Fortaleza (Brazil), July 30 - August, 2000 with ALHSUD and ABAS²
- IGC³ Rio (Brazil), August 6 - 17, 2000
- Geology 2000 Melbourne, November 18 - 26 with ISSMIE⁴, ISRM⁵ and IAEG

Our International Conference, February 5 - 13, 1998 in Melbourne, came in for strong praise related to its advanced organisation and good marketing. I would encourage all of you to strongly support our Melbourne reunion and plan to attend.

A highlight of the Executive Meeting was the signing of the new IAH Book Series contract with Balkema. This will produce most satisfactory arrangements for authors and IAH. All members will be able to purchase these excellent reference books at a considerably discounted price. The details will be explained in the IAH International Newsletter.

In this coming year I hope to be able to contact some of you at the International Congresses (Greece - June and Nottingham - September). I am aware that about 25 Australian delegates will be at Nottingham.

Michael Knight
President, IAH



The handover of the presidency - John Moore, the retiring President (left) welcomes the Incoming President, Michael Knight (Australia).

¹ International Association of Engineering Geologists

² National Drilling Association of Brazil

³ International Geological Congress

⁴ International Society of Soil Mechanics and Foundation Engineering

⁵ International Society of Rock Mechanics

IAH-AUSTRALIA PRESIDENT'S MESSAGE

The growth in membership of the Australian Chapter of IAH is continuing, with over 100 new members joining since the beginning of 1995. This growth can be put down to a general growth in the field of hydrogeology, not only as a specialised part of the geosciences or engineering, but as a component of other professions such environmental science, agricultural science and the mining industry. This broader mix of professions, all with increasing involvement and a significant interest in hydrogeology, can only benefit the IAH.

Although the IAH does offer the Hydrogeology Journal plus occasional publications free for members, the interaction with other professionals in a like field is seen as very important by the majority of members in the Australian context. Most of this interaction is gained through State Committees and their regular meetings, usually with a guest speaker, and the occasional social event. I believe that it is therefore important that State committees should ensure meetings are held regularly.

Many of you have provided some support for sponsorship of hydrogeologists in under-developed countries, and I'm sure are probably wondering if you will ever hear the outcome of this. The committee has been working towards a sponsorship scheme by which the funds raised from Australian members is used to sponsor new members from our part of the world. We discussed at length what countries should be considered, as there are many arguments for and against. We now have a scheme organised, and letters of offers of sponsorship are being sent out to nominated people in the Pacific region. I will provide a full report on the sponsorship program in the next newsletter.

For the past two and a half years the National Executive has been held by Queensland with all office bearers and the national committee from this State. I see no reason to change the system whereby the National Committee is vested in one State, with the different States (or Territories) taking turns. Any other system would not be practical in an organisation such as ours. However as the IAH continues to grow, a reasonable commitment needs to be given to the running of the National Committee, as the task does take a fair bit of time. The activities include, organisation of finances, collection of fees, contact with IAH headquarters, production and distribution of the newsletter, the new sponsorship scheme and many smaller tasks. I would also note that this work is carried out by already overworked professionals on an honorary basis. However, we now need to start thinking about who will be taking over the reins when Queensland's tenure is up, in February 1998. I would like to hear from any State/Territory Committee who would be interested, or at least keen to discuss the matter. A 3 to 4 year term is usual.

John Hillier
President IAH-Australia

Editor's Comment

This is the first newsletter for 1997. As you can see from the cover, this is issues 1 and 2. I must apologise for the delay, it is entirely my responsibility, but I am afraid that with demands on time, and pressures of work, it was the earliest that I could get to it. Hopefully, the contents will be of interest and worth the wait. I encourage members to submit anything that they consider to be of interest. Send it anytime.

The best way to send Newsletter items is direct to the editor, either by email (which I can extract and reformat), or mail it in a camera-ready form of A4 size (which will be reduced to A5). To:

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NEWS FROM THE STATES AND TERRITORIES

AUSTRALIAN CAPITAL TERRITORY

CRC for Catchment Hydrology Seminar

High resolution soil moisture patterns from the ground and from space:
Measurement and use in modelling.

Rodger Grayson, Centre for Environmental Applied Hydrology and CRCCH,
University of Melbourne
Thursday May 1

CSIRO Land and Water conference room Black Mountain, Canberra

Specialised equipment enables us to collect high resolution ground based measurements of the spatial patterns of soil moisture. Data collection on a 10 m by 20 m grid over a 10.5 ha agricultural catchment in SE Australia has been undertaken on more than 13 occasions, along with meteorological and runoff measurements. Over 120 soil cores have also been collected enabling detailed descriptions of soil type and depth. Seventy piezometers and 20 access tubes for a Neutron Moisture meter are regularly read to provide information on subsurface dynamics. In addition, overpasses by the European Space Agency satellite ERS1/2 and an overflight by a specially equipped NASA plane collected Synthetic Aperture Radar (SAR) images coinciding with ground data. These provide the opportunity for the most detailed ground truthing of SAR data for soil moisture estimation yet undertaken.

These data will be used to explore the spatial hydrological response of the catchment to particular runoff events and to changes over several weeks and months. This will be done both through direct analysis of the data and by using a distributed parameter hydrological model. The use of terrain based wetness indices for establishing antecedent conditions for dynamic modelling will also be discussed.

NEW SOUTH WALES

Branch Meeting

February.

The NSW branch was fortunate in February to enjoy a quality presentation entitled "Constructing LPG Caverns Under Botany Bay". The talk was delivered jointly by Warren Nielsen (Project manager for ELGAS) and Jean Mark Morisseau, the project consulting hydrogeologist. The project involves the construction of unlined gas caverns within Hawkesbury Sandstone some 120 metres below Botany Bay.

Understanding the groundwater flow system is critical to the success of the scheme which involves generating a hydraulic shower immediately above the main gas chambers to ensure sandstones remain wetted and hydraulic pressures are sustained. The shower curtain is maintained by a large number of injection bores, each of which can be precisely adjusted. The discussion attracted a large and enthusiastic audience.

April.

In April, Mike Williams provided an entertaining discussion "Groundwater Exploration and Management in Laos" at the Parramatta Club. He provided an overview of field investigations focussed towards developing a regional groundwater management strategy for an upland area in central Laos. Mike enjoyed difficult working conditions - boggy tracks, no field data, potential unexploded ordnance, a varied diet including rice, rice and some chicken, but he noted the local population were remarkably informed in relation to groundwater matters.

General

NSW chapter of the IAH remains dedicated to providing a forum for discussion between scientists and engineers involved in hydrogeology, on a regular basis. Presentations are arranged bi-monthly and held at the Rugby Club in Sydney, UTS, or the Parramatta Club. Interstate visitors are welcome to attend. The following dates have been scheduled for the remaining 1997 discussions:

- 14/05/97: UTS (Dr G. Sewell - Flow-meter borehole measurement)
- 18/06/97: Rugby Club (Hydro Geochemistry - speaker to be finalised)
- 13/07/97: Rugby Club (Transfield - Hydrogeology of the Airport Railway Tunnel)
- 15/10/97: Rugby Club (Students Night) - always a great night
- 03/12/97: UTS (Col Dudgeon - Man Made River Project in Libya)



The National Study of Cemetery Groundwaters has begun. Boyd Dent is conducting the research under the supervision of Michael Knight and Bill Milne-Holme for his PhD degree. The Study is seeking to assess the general hydrogeochemical nature of the uppermost aquifer or seepage waters in cemeteries. The Australian Cemeteries and Crematoria Industry is supporting the research by funding direct costs whilst Boyd remains employed as a lecturer at UTS. The Victorian Department of Human Services has made a special research grant available for the Study in Victoria.

Cemeteries are significant users of the land, and remain in use for a very long time - in perpetuity for most. They are found in many and varied hydrogeological settings and often occupy land which today is considered to be "environmentally sensitive". In 1995, Boyd showed that decaying human remains produce traceable salty plumes in the aeolian aquifer of Botany Cemetery. The current Study greatly extends this work to sites in Perth, Adelaide, Launceston, Melbourne, and Sydney. The mass of human remains and funereal aspects of the interment vary considerably from site to site; it is suspected that these may influence the decay factors.

The Study is expected to be complete in 1999 with significant results available from about mid '98. Boyd can be reached through the National Centre for Groundwater Management at UTS or by e-mail as: B.Dent@uts.edu.au

MULTICOMPONENT CONTAMINANT TRANSPORT:

THE COUPLING OF CHEMISTRY WITH MASS TRANSPORT AND FLUID FLOW

30 JUNE - 4 JULY

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QUEENSLAND

Branch Meeting

8 April 1997

Responses in pressure heads of the Great Artesian Basin as a result of rehabilitation of artesian bores and drains.

John Hillier¹ and Douglas McAlister^{1,2}

(¹Department of Natural Resources and ²Queensland University of Technology)

The Great Artesian Basin (GAB) is one of the worlds largest artesian systems. This basin underlies approximately 1.7 million km² of Australia. Flows peaked in the basin early this century and have dropped of ever since. Pressure reduction of up to 80m head has caused many artesian bores to become sub-artesian making pumping necessary.

The greatest potential problem to the Basins long term economical usefulness is that of uncapped flowing bores. Many of these form large swamp areas wasting large quantities of water. A second factor is that of open bores drains used to distribute water. Excessive evaporation of water occurs in these drains again wasting large volumes of water. In the 1989/1990 financial year an extensive rehabilitation program was undertaken by the old Water Resources Commission.

To date over 200 bores have been rehabilitated. A minimum 600 bores are still in need of rehabilitation in the future. A monitoring network of bores was established at the same time. This network contains around 220 bores and are measured in a three year rotation. Further measurements are made of other artesian bores across the basin. Static, flow recession and dynamic tests are carried out on these bores where possible. Modified Sternberg Analysis was used to analyse this acquired data.

Data for swl's for the GAB has been gathered for previous years back to 1984. Comparisons have been made between present and previous levels in order to gauge whether pressure heads are increasing in response to rehabilitation. This data is being used to show pressure trends across the basin to gauge the effects of the rehabilitation scheme.

Gerard McMahon

School of Natural Resource Sciences, QUT

(Confirmation of Candidature Presentation for PhD)

Groundwater resources of the Burdekin River Delta: geochemical character, potential and management

The Burdekin River Delta is a large aquifer system that provides groundwater to sugar cane growers and to the local townships. The delta is bounded to the west and south by escarpments of basement rocks and to the east and north by the coastal seawater boundary. In many bores, the basement has been intersected and comprises the same granitoids found in the coastal highlands. As an unproclaimed district, water use in this area is not metered so pumping rates may well be exceeding natural recharge. Vertical hydraulic continuity appears to exist through the delta as represented by bore hydrographs.

However, determining the extent of lateral continuity is problematic considering the nature of sedimentation that has occurred in the delta during the late-Pleistocene to present day. Fast sedimentation rates have resulted in periodic channel avulsions across the flood plains which produce interfingering sand and gravel bed lenses in section. Also, the large levee banks that are characteristic of the main river channels are often breached during major flood events (recurrence interval = 1 in 10 years) so flood plain silts make common aquifer "separators". The complexity of sedimentation is essential to understanding the controlling factors of groundwater occurrence and movement. Hydrochemical variations are also incorporated into the study to observe the distribution of water types and location of major recharge/discharge areas.

This project aims to develop a working conceptual hydrogeological model of the delta that can be used to develop irrigation and management techniques. The subsurface aquifer stratigraphy is a key component to the study as are the physical and chemical characteristics of the groundwater itself. The final objective is to observe how the aquifer parameters control the ongoing threat of saltwater intrusion. The study will include interpretation of delta stratigraphy from the massive groundwater geology database contained at the Department of Natural Resources.

POST-GRADUATE RESEARCH IN HYDROGEOLOGY AT QUT

Research in this discipline is very active at QUT with an interesting range of topics. From January, 1997, the Faculty of Science restructured, and the previous School of Geology is now incorporated as the Earth Science Section within the new School of Natural Resource Sciences. These projects are within the new school. Much of this research activity has been made possible by cooperative programs with the Queensland Department of Natural Resources. This approach has resulted in an effective combination of human, field, analytical and computing resources, and a spectrum of supervisory expertise. Following is a current list of post-graduate students and their research topics.

PhD

- Jiaorong Li: Groundwater in the Teviot Brook catchment, Boonah: controls on its occurrence and chemistry
- Gerard McMahon: Groundwater resources of the Burdekin River delta: geochemical character, potential and management
- Vivienne McNeil: Computer-based methods for assessment and interpretation of large water chemistry data sets applied to the Great Artesian Basin, Queensland
- Micaela Preda: Acidity, environmental geochemistry and setting of the tidal Pimpama River and its catchment
- Jaya Dharmasiri: Isotope and chemical studies on the mechanisms of recharge to alluvial aquifers in Gatton, Lockyer valley. (School of Physical Sciences, QUT)

MAppSc

- David Dempster: Groundwater occurrence and saltwater intrusion in the coastal Gooburrum aquifer, Bundaberg irrigation area
- John Harbison: The occurrence and chemistry of groundwater on Bribie Island, a large sand island in Moreton Bay
- Jason Keys: Groundwater and causes of salinity in the Balfes Creek catchment, Charters Towers area
- Robert Lait: Groundwater chemistry, occurrence and problems, in the fractured Hodgkinson Formation, Mareeba area
- Katrina Locsey: Regional hydrochemistry, recharge characteristics and inter-aquifer recharge of the Murray and Otway Basins, Victoria - South Australian Border zone
- Douglas McAlister: Groundwater resources of the Tertiary sedimentary sequences in the St George area, central-south Queensland
- Robert Virtue: Hydrogeology, recharge mechanisms and groundwater flow in the Pleistocene Dumersq River "deep aquifer", Qld-NSW Border Rivers area

Honours

- Daniel Barclay: Groundwater character and migration within the Tertiary basalt aquifers of the Ormiston "peninsula", southern Moreton Bay
- Ronnie McLean: Hydrological processes and catchment morphology, and their influence on water composition and quality, Tallebudgera Creek, southeast Queensland

WESTERN AUSTRALIA

BRANCH MEETINGS

December 4th 1996 Student Night

John Rich Murdoch University

Study of natural and artificially induced flow regimes in a coastal wetland at Perry Lakes

Margaret Smith University of WA

Use of non reactive tailings material as a tailings dam cover to help minimise acid rock drainage

Ryan Vogwill Curtin University

Aspects of the hydrogeology, environmental geochemistry and sedimentology of Lake Walyungup

Monday 24th February 1997

Dr Sucharit Koontanakulvong Chulalongkorn University of Bangkok

Artificial recharge and groundwater management in Thailand

Monday 24th March 1997

Dr Brian Logan Aries Pty Ltd,

Hydrogeology of the Lake Macleod evaporite basin

Monday 28th April 1997

Doug Brown Sinclair Knight Merz

An alternative approach to pumping test analysis with application to a large sedimentary aquifer in northern Chile

PALAEOCHANNEL SEMINAR

26th May 1997

Chairman: John Throssell

Speakers:

Philip Commander Water and Rivers Commission

Hydrogeology of palaeochannels in WA

Seth Johnson Water and Rivers Commission

Palaeochannels of the Northeastern Goldfields

Josef Holzschuh University of Western Australia

Application of geophysics to palaeochannel exploration in the WA goldfields

Simon Nield Nield Consulting

Alternative approaches for modelling groundwater flow in palaeochannels

Jeff Turner CSIRO

Coupling the distribution of solute concentration to recharge-discharge processes in the Eastern Goldfields

Jon Hall Woodward Clyde

Now where did the palaeochannel go?

The meeting ran from 4pm to 8pm and was well attended with 75 participants. The six speakers are thanked for their extremely interesting presentations. A buffet refreshment was provided and kindly sponsored by **Montague Drilling**.

The **Annual General Meeting** is to be held on 23rd June, and will be addressed by Prof John Wilson of New Mexico Institute of Mining and Technology on "Visualisation of groundwater flow and transport through a microscope".

PALAEOCHANNEL SEMINAR WA BRANCH

Prepared by Phil Commander

The importance of the hydrogeology of palaeochannels was illustrated by a high level of interest and the attendance of seventy-five members and visitors at the recent seminar organised by the WA Branch.

The geological history of the Cretaceous and early Tertiary, which leads to an understanding of the palaeodrainage pattern was introduced by *Phil Commander*. Modification of the drainage pattern, principally by south flowing rivers resulting from breakup of Australia and Antarctica, and subsequent tilting of the continent, is an important factor controlling the hydrogeology of Eocene palaeochannels. Examples from the southwest, where fresh water occurs due to dissection of the Tertiary palaeochannels contrast with examples from the hypersaline conditions in the Eastern Goldfields. Eocene pisolite and later calcrete in the Pilbara, which contrast with the sand/clay of the south, nevertheless showed similarities in hydrogeology. It was proposed that the term palaeochannel should be restricted principally to the concealed Tertiary palaeochannels, unless a clear definition otherwise is made.

Seth Johnson compared the hydrogeology of the palaeochannels in the Kalgoorlie region with those in the Carey Palaeodrainge to the north. In that area the sediments are thicker and more varied, and the tributaries contain fresh or brackish groundwater as opposed to hypersaline. Seth showed how the provenance of the sediments was important in predicting groundwater occurrence, contrasting greenstone catchments and granitic catchments.

Joseph Holzschuh presented the results of different geophysical methods applied to locating palaeochannels, using examples from the Mt Keith area south of Wiluna. He showed that gravity profiles could clearly distinguish the palaeochannels, and provide a rapid and cheap exploration tool. Electromagnetics can also be used with success, depending on the conductivity of the overlying material, and appropriate aerial surveys are a cost effective way of mapping. The potential of seismic reflection for detailed analysis of the stratigraphy was also discussed.

Quantitative modelling was outlined by *Simon Nield*. Simon further discussed the difficulty of modelling palaeochannels with insufficient data on the characteristics of the bounding material. Many questions exist, and the audience was left wondering whether modelling was a useful exercise at all in these applications.

Jeff Turner described the results of research into the chemical and isotopic changes along hypersaline palaeochannels in the Kalgoorlie area. He discussed the observed distribution of the isotopes carbon-14 and chlorine-36. Jeff compared a number of methods for determining the groundwater resource, concluding that the life time of the resource at current rates of groundwater mining is about two decades.

The evening was rounded off by *Jon Hall* who presented some practical examples from across Australia, of how difficult it can be to predict the course of the palaeochannels. He showed numerous examples of how modern topography can be quite misleading. Jon provided some warnings for young geologists in the pitfalls of field identification, such as the problem of distinguishing deep weathered bedrock from palaeochannel sediments. Jon also illustrated the practical difficulties of drilling in the dreaded "donkey dick" clays, which are a known headache for drilling contractors, and he outlined the preferred methods for exploration drilling.

The interest was confirmed by questions and the later extent of the audience discussion. During the seminar participants were refreshed from the Department of Minerals and Energy social club cafeteria by the courtesy of Montague Drilling.

GENERAL NEWS

Workshop on Organic Contaminants in Groundwater & Soil

Held at RMIT in Melbourne, Thursday 20 & Friday 21 March 1997:

ORGANISED BY

The Centre for Groundwater Studies in cooperation with RMIT

TOPICS

- Policy, guidelines, procedures
- Physical behaviour
- Biochemical and chemical issues
- Microbiological analyses and issues
- Field investigation/sampling/monitoring
- Contaminated site investigations
- Remediation strategies

Summary:

The workshop will focus on understanding the behaviour of dissolved and free-phase organic contaminants in groundwater and soil, will investigate strategies and sampling and monitoring techniques for characterising sites contaminated with organic compounds, and will include an assessment of the effectiveness and limitations of in situ and ex-situ remediation strategies (eg pump and treat, natural bioremediation, air sparging, biotreatment piles). Case studies and hands-on, tutorial sessions will be presented throughout the workshop related to field sites where petroleum hydrocarbons (eg gasoline, diesel), chlorinated hydrocarbons (eg TCE, chlorinated phenols), and other organic compounds have contaminated groundwater and soils. A demonstration of laboratory techniques, instrumentation and equipment will also form part of the workshop.

PRESENTERS:

Greg Davis, CSIRO
Bruce Anderson, RMIT
Jeff Bazelmans, CMPS&F
Phillip Marriott, RMIT
Alexandra Dimos, CMPS&F

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THE SIXTH MULTIDISCIPLINARY CONFERENCE ON SINKHOLES AND THE ENGINEERING AND ENVIRONMENTAL IMPACTS OF KARST

April 6-9, 1997, in Springfield, Missouri, USA.

web site at the following URL.
<http://www.uakron.edu/geology/karstwaters/6th.html>

Please e-mail us at pelaor@usit.net

Barry F. Beck
J. Brad Stephenson
Zhou Wanfang
Gayle Herring

Symposium on " Carbon Cycle and Karst Processes"

Lipu on south of Guilin April 26, 1997 to April 30, 1997.

IGCP 379 (Carbon Cycle and Karst Processes) project will report the recent research progress on karst dynamic system, evaluation of the source-sink of the atmospheric CO₂ in karst processes and paleoenvironmental information records in karst area.

Participants can visit 5 km long Fengyu Cave (a beautiful tourism cave), with a subterranean river and many marvelous speleothems. The most typical Fenglin (peak-forest) karst landscape is around Yangshuo. We will also investigate 270 m long Panglong Cave where, in Fengcong (peak-cluster) near Yangshuo, we took a 1.2 m long stalagmite for reconstructing the paleoenvironmental change during the past 36,000 years.

The karst experimental site in Guilin is located in the boundary between Fengcong and Fenglin, with many modern climatic and hydrological facilities. There are some intermittent and permanent karst springs and other typical karst features for field researches. Soil profiles, about 3 m deep, are built to monitor the regime of soil CO₂ content. Some plastic tubes and vessels were installed at different depths of the soil profiles, so it is easy to measure the soil CO₂ concentration with CO₂ detector and monitor the chemical characters of the soil water.

IGCP 379 has gotten the typical CO₂ distribution curve of the karst soil profile every month. We will demonstrate the monitoring facilities and methods in the site.

This meeting is sponsored by IGCP 379 project and supported by Geological Society of China and Lipu county. More details about the meeting is in our new home page site: <http://www.gxnu.edu.cn>

Dr. Jiang Zhongcheng on behalf of
Prof. Yuan Daoxian
The Institute of Karst Geology,
Qixing Rd. 40, Guilin 541004
P.R. CHINA
<http://www.gxnu.edu.cn>

Special Session Announcement 1997 American Geophysical Union Spring Meeting Baltimore, May 27-30, 1997 Hydrologic Restoration

Conference information available at <http://www.agu.org>

Human activities have had profound effects on the landscape, and hence on the hydrology of streams, lakes, wetlands, and other aquatic systems. Primary effects include increases in flood peaks, flood volumes, and sediment loads; decreases in baseflow discharges; degradation of water quality and aquatic habitat; and channel erosion. Attempts to mitigate these effects in agricultural, forest, range, and urban settings have included implementation of land and water management practices, restoration of wetlands and other natural landscape features, and stream rehabilitation. This session explores technical issues associated with hydrologic restoration, including establishment of restoration goals and criteria; hydrologic characterization under past, present, and future conditions; and evaluation of restoration strategies.

Conveners: Kenneth W. Potter, Department of Civil & Environmental Engineering,
University of Wisconsin, 1415 Engineering Drive, Madison, WI 53706,
Phone: 608-262-0040, E-mail: potter@engr.wisc.edu
Derek B. Booth, Center for Urban Water Resources Management, Department of Civil Engineering,
University of Washington, Box 352700, Seattle, WA 98195,
E-mail: dbooth@u.washington.edu

FLOOD ESTIMATION AND FLOOD MODELLING WORKSHOP

APRIL 1 - 4, 1997

UNIVERSITY OF NEW SOUTH WALES, SYDNEY, NSW

In December 1987 the third edition of Australian Rainfall and Runoff (ARR) was published by the Institution of Engineers, Australia. This guide to practice was prepared under the general editorship of David H. Pilgrim, Professor of Civil Engineering at The University of New South Wales.

The University will conduct a Workshop on the use of this guide to practice specifically geared to meet the needs of practitioners. In the first two days, the Workshop will cover the use of Australian Rainfall and Runoff for estimating floods for design purposes. In addition some new developments that have occurred since 1987 will be presented. Participants will then have an opportunity to attempt realistic design problems using ARR and to discuss application of it to their own design situations. On days 3 and 4 there will be detailed discussion of flood modelling, with some reference to storm water quality modelling. Most of these two days will be spent in the computer laboratory running models such as RORB, RAFTS, SWMM, AQUALM etc.

Emeritus Professor David H Pilgrim,
Associate Professor Ian Cordery,
Dr James E Ball,
Mr Andrew Coates,
Dr Ashish Sharma,

Flood estimation workshop will treat in detail:

Design Rainfall, Small Catchment Flood Estimation, Runoff Routing, Flood Frequency, Urban Drainage Design including Detention Basins, and Quality of Urban Runoff, Choice of Method for Design

Flood modelling workshop will cover:

Principles of modelling, model algorithms, Parameter estimation, model calibration and verification, Hands on operation of models by participants

PROGRAM

Day 1: Overview of flood estimation. Rainfall data Small catchments, urban drainage
Day 2: Flood hydrograph methods. Loss estimation Flood frequency. Extreme floods
Day 3: Model concepts. Calibration, validation Theory and hands on use of RORB, RAFTS
Day 4: Time-area concepts, pipe and channel routing. Urban applications
Water quality modelling. Hands on use of AQUALM, SWMM.

For copy of full information brochure with application form:

<http://www.civeng.unsw.edu.au/courses/Short/flood-1.4.97/flood.htm>

Technical information, please contact:

Associate Professor Ian Cordery

Tel: (02) 9385 5024

Fax: (02) 9385 6139

Email: i.cordery@unsw.edu.au

Gut holds a drop

A MEATLOAF look-alike who fell into a 13-metre deep well was saved by his enormous beer gut.

Birmingham metal worker Steve Walters – who claims to down 100 pints of beer a week and eats a loaf of bread with every meal – sports a whopping 142cm waist.

While gardening, the earth collapsed under him and he fell into a hidden Victorian well.

Mr Walters, 36, believes he would have drowned even if he had survived the 13-metre plunge. But he remained stuck half-way down for 15 minutes until his wife and neighbours could “unplug” him.

“I’ve taken stick for being fat all my life. But if I’d taken doctors’ advice and dieted, I’d be dead.”

Steve, who has long brown hair and bears a strong resemblance to his idol, rock star Meatloaf, said it took guts to stay in the hole.

MEDIA RELEASE

Date: 4 June 1997
For Immediate Release

Contact: Andrea Wishart
BNR3 Organising Committee
Ph: 07 3369 9822

Lorelei Baum
VIVA Holdings
Ph: 0411 852 378

THIRD ASIA PACIFIC CONFERENCE FOR LEADING WATER TREATMENT SPECIALISTS

Advancements in environmentally-friendly Biological Nutrient Removal (BNR) technology will feature prominently on the agenda at the BNR3 conference in Brisbane from 30 November to 4 December this year.

Four hundred delegates from throughout the Asia Pacific region will converge at the Brisbane Convention Centre to address nutrient removal and BNR implementation issues. International authorities on BNR, Professor George Ekama, from South Africa's University of Cape Town, and Mr Ken Lindrea from La Trobe University head an impressive line-up of speakers.

Wastewater treatment is a major industry in Australia, with annual expenditure of \$5 billion per annum. In terms of the number of plants, South East Queensland is leading Australia in the adoption of BNR, which uses natural biological organisms to purify wastewater and remove the nutrients of nitrogen and phosphorus. BNR is an effective method of removing wastewater nutrients that are responsible for blue green algae outbreaks, and unlike traditional sewage treatment methods, BNR does not use industrial chemicals.

Due to its low whole of life cost and sound environmental contribution, BNR is one of the fastest growing technical areas in pollution control and treatment of wastewater in the world with 27 Australian plants using this technology.

The BNR3 Conference is being hosted by the International Association of Water Quality and the Australian Water and Wastewater Association. Major sponsors, Advanceo Water and Wastewater Technologies, John Wilson & Partners and ANI Kruger are just three of the many organisations supporting the conference.

Dictionary of Hydrology and Water Resources

by G. Stanger

Lochan Publishing, 32 Dutchman Drive, Hallett Cove, SA 5158, A5 paperback, 208 pages plus appendices 18 pages.

Price \$30 + \$3.50 postage in Australia. \$5.00 discount to LAH members

This dictionary is an inexpensive, useful and comprehensive reference work on hydrology. The stated objective of the author is to give user friendly explanations rather than formal definitions and he achieves this aim. At the back he gives a list of acronyms commonly used in hydrology and water resources which will help people baffled by the too common use of initials only in reports; as well as a list of well known hydrological, hydrogeological, hydrochemical and water management computer programs, and a list of suggested readings under various key words. I can recommend this dictionary for the libraries of all hydrogeologists.

I only have a few criticisms. The absence of entries under chloride, bicarbonate, sulphate and sodium, the main ions in groundwater, though carbonic acid is mentioned. I consider the entry on balynology rather unfair - and the absence of an entry on spa resorts - considering the numbers of health spas in Europe, and their widespread acceptance by doctors and health insurance schemes there. While I accept, as the dictionary states, that there is no good worldwide accepted definition of the term 'mineral water', the one now generally accepted by the main bottling companies in Australia is 'carbonated water with a total dissolved salt content over 300mg/l and with higher bicarbonate than chloride.

AUS.GEO News 39

April 1997

Defining Aboriginal water-supply issues in central Australia**A bicultural approach integrates science and traditional knowledge**

As part of its 'Western water' study (see *AUS.GEO News* 30, for October 1995, p. 9) in the southwest Northern Territory, AGSO engaged Toyne Remote Area Consultancies to facilitate consultations with Aboriginal communities for outlining practical initiatives that would benefit community water supplies. The outcome of the consultations is a clear statement from the Aboriginal people about the water issues that affect them. The consultant's report provides a starting point for systematic work by the Aboriginal stakeholders on water issues and the resources potential of the region.

The consultancy sought to bridge the gap between Aboriginal knowledge and beliefs about water and the outlook of the scientific and government sectors on water-supply issues. The emphasis of the consultations was on developing creative plans with Aboriginal-community members for better supply and use of water. These plans will now be facilitated by the use of the regional groundwater information system developed by AGSO and its collaborating agencies — the Northern Territory Department of Lands, Planning & Environment and the Central Lands Council.

The community consultations revealed that the development of water programs could be linked effectively to the extensive Aboriginal knowledge of water. Aboriginal people have lived in this arid land continuously for more than 20 000 years. Although modern needs for water exceed those which traditional sources can supply, the link opens up the prospect of a bicultural approach to water issues, and might prove to be the key to successfully developing and maintaining

water supplies. The consultations also revealed extensive water use throughout Aboriginal lands, not just the main population centres. The consultant's report advocates a regional structure to water management.

The consultations applied a bicultural model to the formulation of a regional water program that considers:

- all activities connected with the supply and handling of water in both traditional and contemporary contexts; and
- all domestic, public, and enterprise activities which have a strong dependence on water supplies or sources.

The bicultural model proved to be an effective vehicle for discussing water issues, and may be relevant to other bicultural situations. It stimulated the presentation of a number of specific proposals from Aboriginal people for water-related developments in their communities and lands, including:

- new community infrastructure developments, such as wool lofts and swimming pools;

- calls for the provision of survival water supplies along isolated roads — a serious concern in this region; and
- developing potentially commercial enterprises, including ecotourism and the harvesting of bush tucker.

AGSO has now published the consultant's report ('Towards a bicultural regional water program in central Australia — consultations with Aboriginal community groups' by Peter Toyne & others), which represents a purposeful step towards empowering Aboriginal communities with the definition and development of their basic and cultural needs.

The bicultural approach exemplified in the Toyne report is a model that could well be applied by diverse agencies contributing to the resolution of other Aboriginal community issues. The Toyne report costs \$25 + postage and handling charges of \$5 (in Australia) or \$15 (overseas).

For further information, contact Gerry Jacobson at AGSO (tel. +61 6 249 9758, fax +61 6 249 9970, or e-mail gjacobso@agso.gov.au).

Seawater Gives Japanese Aquifer a Lift

Resistivity profiling is used to study a volcanic island's ground water resources.

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Summary: In this study, Japanese scientists used two-dimensional models of the earth's resistivity structure to locate and develop ground water sources for an irrigation project.

Electrical properties of soil and rock are largely determined by water content and rock composition. A zone with high water content, such as a fracture zone, usually has an anomalously low resistivity. The resistivity structure of the earth thus can be used to identify potential aquifers.

Vertical electric soundings using the Wenner or Schlumberger arrays are often conducted for such ground water exploration. This model assumes that the earth's resistivity properties vary only with depth and have few lateral changes. In many instances, such as in volcanic deposits, investigations must be conducted at locations that have significant lateral variation, too. In these situations, a two-dimensional survey that produces details of significant two-dimensional objects provides better results.

This study was conducted as part of a road construction project in the southernmost section of the Rishiri Volcano on Rishiri Island, off the coast of Hokkaido, Japan. The island consists of highly resistive Quaternary basaltic lava that overlies older volcanic deposits and Tertiary sediments. Trees were to be planted along the road to prevent snow from drifting across the pavement. The purpose of this survey was to locate and develop ground water resources to irrigate the trees.

No Evidence of Ground Water

The area is nearly flat, uncultivated and shows no evidence of ground water from the surface. It was originally proposed that if the most recent lava flow filled an ancient valley, ground water might flow in the area where lava is thickest. Using this assumption, a resistivity profile was placed across the

midpoint of the most recent lava flow. Here a two-dimensional resistivity investigation was conducted to optimize placement of a water well needed for irrigation.

Resistivity image profiling, using a digital stacking resistivity meter, was conducted along a 600 meter (m) line to study the ground water. The resistivity data was collected using a pole-pole array with a minimum separation between the current and potential electrodes of 10 m and a maximum separation of 100 m. The recorded apparent resistivity data was corrected for effects caused by changes in topography and for unwanted effects caused by the electrode configuration.

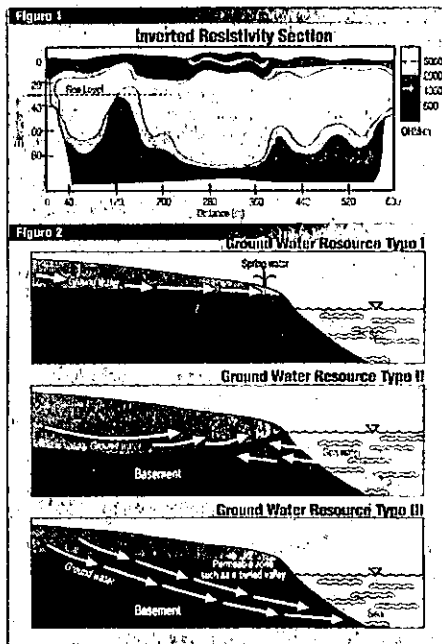
From an initial model, a synthetic

potential distribution was calculated using forward modeling algorithms based on either the alpha-center method or the finite-element method. A two-dimensional resistivity inversion algorithm was used to produce the final resistivity cross-sections shown in figure 1. The data shows the existence of a shallow high resistivity cap approximately 70 m thick. The underlying layer, with lower resistivities, undulated. The top surface of this layer has a maximum elevation change of 50 m.

Three Models to Determine Flow

Yamaguchi (1975) compiled hydrological data for Rishiri Island and proposed three models that might explain the island's ground water flow and distribution (figure 2).

The first model (Type I) suggests that ground water flows down to permeable beds overlying imperme-



able bedrock and surfaces through springs in coastal areas. Many springs found in the northern and eastern part of the island could be explained by this model.

If the bedrock surface lies below the sea level and the permeable layer extends into the sea, then saline water will move inland (Type II). According to this model, fresh water — which is less dense than seawater — would float on top of a wedge of intruded saline water.

The third model (Type III) assumes that ground water drainage is controlled by some feature, such as a buried valley, which increases the pressure gradient enough to form fresh water springs on the sea floor. Such springs are known to exist at several locations around the island.

The site of this investigation showed no evidence of surface springs; we searched for ground water of either Type II or III model. From this approach, figure 1 shows two points to develop the resources of the ground water, at distances of 120 m and 300 m. The ridge-shaped low resistivity at 120 m seems to be influenced by saline water.

Assuming a Type II model, we recognize this area of low resistivity as a permeable zone with fresh water floating on top of denser saline water. Presuming the high resistivity layer is lava, the basin-shaped high resistivity layer is likely an ancient valley. In such a case, we expect a Type III ground water flow. Based on the Type II model of ground water flow, the area above the conductive plume near the 120 m location is most likely to produce ground water at the least cost.

A 50-m deep test well was drilled at the point of the low resistivity rise. The results showed that the uppermost 36 m consisted of highly permeable gravel, breccia and basaltic lava (figure 3). At a depth of approximately 40 m a layer of tuff breccia contained chloride-rich ground water,

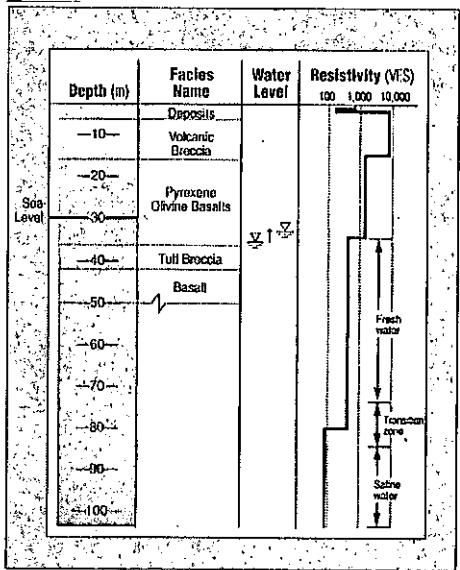


Figure 3. Geologic column by drilling and result of electrical survey at location 130 meters.

supporting the theory of the seawater invasion uplifting the aquifer. Chloride ions found in the ground water could have diffused up from the deeper seawater. This evidence suggests that the Type II model most accurately reflects the conditions.

Geochemical analysis of the ground water showed that all cation and anion concentrations except chloride fell within the limits for potable water as set by Japanese regulations. This ground water can be used for irrigation once it is treated for the high chloride concentration. □

Jun Matsuo, Takuhiro Harada and Masaki Osada work for OYO Corp., Sapporo, Japan, and Masayuki Inoue and Mizuo Sugawara are with CE Service Corp., Sapporo, Japan.

Yamaguchi, H., 1975. Groundwater and Its Water Balance in the Rishiri Island (in Japanese). *Journal, Hokkaido Geological Survey* 47: 1-21.

SOFTWARE

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Scientific Software Group markets over 125 groundwater, surface-water, bioremediation, air pollution, geotechnical, monitoring, and other environmental models and software programs. We believe we have the lowest prices, and technical support is provided direct from each individual developer.

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Parallel PEST

Watermark Computing would like to announce the arrival of Parallel PEST, a version of PEST that can distribute model runs across a PC network of the type found in just about any office environment.

Parallel PEST is a version of the model-independent parameter optimizer, PEST. Because PEST communicates with a model through the model's own input and output files, PEST can be used in the calibration of any existing model. It implements a particularly robust variant of the Gauss Marquardt Levenberg technique, running a model as many times as it needs to until the fit between selected model outputs and corresponding field data is reduced to a minimum in the weighted least squares sense. It achieves this fit by adjusting selected model inputs/parameters as identified on one or more input files.

PARALLEL PEST allows a PEST user to distribute model runs across a PC network. This reduces overall PEST optimization time enormously, making it possible to calibrate large and complex models for which application of nonlinear parameter estimation techniques would have hitherto been considered impossible.

For more information on PEST and Parallel PEST see the following web pages, which include descriptions and an example of the use of Parallel PEST in calibrating a complex recharge/groundwater model:-

www.ozemail.com.au/~wcomp

Dr. John Doherty
Watermark Numerical Computing
336 Cliveden Avenue
Corinda 4075

Phone: +61 7 3779 1664
Email: jdoherty@gil.com.au

TRAINING AND SUPPORT

GROUNDWATER MANAGEMENT POSTGRADUATE PROGRAMS

Short Course Mode

The National Centre for Groundwater Management (NCGM) at the University of Technology, Sydney is recognised by the Federal Government through the Land and Water Resources Research and Development Corporation as a National Centre for Training, Research and Consultancy in Groundwater and Environmental Applications.

A range of postgraduate programs is currently being offered:

- Master of Engineering and Master of Science (1 year course work degrees)
- Graduate Diplomas (Engineering or Science)
- Master of Engineering and Master Science (Research)
- PhD
- Graduate Course (15 weeks)

Flexible Delivery Mode:

- Short-course delivery format
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- Part-time
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Study areas include:

- Groundwater Contaminant Transport Modelling
- Quality and Quantity Optimisation Strategies for Water Resource Development
- Waste Management and Groundwater
- Contaminated Land Evaluation and Rehabilitation
- Bore Fouling and Maintenance
- Practical Areas of Hydrogeology including Geophysics, Hydrochemistry and Microbiology aspects
- Land and Groundwater Salinity

For Applications and Information contact:

Professor Michael J Knight
Director
National Centre for Groundwater Management
University of Technology, Sydney
PO Box 123
Broadway NSW 2007
AUSTRALIA

Phone: (02) 9514 1984
Fax: (02) 9514 1985
E-mail: groundwater.management@uts.edu.au



The Centre for Groundwater Studies, in cooperation with UNSW Groundwater Centre, presents

AQUIFER HETEROGENEITY AND OPTIMAL CAPTURE OF CONTAMINANTS

(also applicable to optimal mine dewatering and optimal design of wellfields)

Sydney: Tuesday 15 - Friday 18 July 1997

PRESENTERS

Professor John L Wilson - New Mexico Institute of Mining and Technology

Professor Steven Gorelick - Stanford University

Dr Lloyd Townley - CSIRO Land and Water, Centre for Groundwater Studies

This course focuses on the design of pumping schemes (number, location and recovery rates) for the remediation of polluted aquifers and the protection of groundwater quality. Many of the concepts also apply to optimal mine dewatering, design of water supply systems subject to environmental constraints, and also to other situations where optimal solutions are sought. The design process includes consideration of uncertainty about aquifer properties, due to natural heterogeneity.

PREREQUISITES

Basic concepts of groundwater hydrology

Modelling experience will be useful but not essential

TOPICS

Flow and transport modelling concepts

Numerical methods for flow and transport (Trescott2D and MODFLOW)

Management of groundwater systems using optimisation

Linear programming (using MINOS)

Optimisation using the embedding approach (using EMBEDPC)

Characterisation of heterogeneous aquifers using geostatistics

Creating synthetic realisations of a heterogeneous aquifer (using GSLIB)

Optimisation using a response matrix approach (using AQMAN)

Optimisation in a heterogeneous aquifer using the multiple realisation approach (using MODMAN+)

Case studies from the USA and Australia

COST

The course fees are A\$1600 and include:

A comprehensive set of notes on arrival at the course

Software: Trescott2D, MODFLOW, EMBEDPC, AQMAN

Lunches, morning and afternoon teas.

TEXT

A book co-authored by Professor Steven Gorelick "Groundwater Contamination: Optimal Capture and Containment" is recommended to attendees, because it covers the material presented at this course.

VENUE and TIMING

The course will be held at the University of NSW in Sydney. The course will run from 8.30am to 5.30pm each day except Friday which will finish at 12 midday.

ACCOMMODATION and CATERING

Further information is available from Heather Bajcarz.

FURTHER INFORMATION

Heather Bajcarz

Phone: +61 8 8303 8700

Fax: +61 8 8303 8750

E-mail: cgs.training@adl.dwr.csiro.au

WWW: <http://www.dwr.csiro.au/CGS>

UPCOMING CONFERENCES

MURRAY DARLING BASIN WORKSHOP '97 TOOWOOMBA 26-28 AUGUST "Groundwater - in the Balance"

The Murray-Darling 1997 Workshop is the sixth in a series of successful workshops convened by the Groundwater Working Group of the Murray-Darling Basin Commission (MDBC). This year it is coordinated by the Queensland Department of Natural Resources and is the first to be held in the northern part of the Basin. The theme of the workshop will be "Groundwater - in the Balance"

The objective of the workshop is to further enhance the integration of groundwater issues into natural resource management in the Murray-Darling Basin. The workshop will encourage contributions from across the Murray-Darling Basin as well as focus on multi-disciplinary projects.

The workshop has been a forum for presentation of current research and investigation results without the need for a formal reporting of those results. This year researchers funded through the MDBC whose work has a groundwater theme will be encouraged to attend and give a more detailed report on their projects. Reports of work in progress are encouraged, with the workshop providing an opportunity for constructive feedback.

The workshop is being held in Toowoomba at the Burke and Wills Hotel. Accommodation will be available at the venue at discounted rates for delegates and from the many hotels or motels in Toowoomba which cover a wide range of tariffs. It will be the responsibility of each delegate to organise his/her own accommodation.

Registration fees for the workshop have been set at \$185 which includes preprints, morning and afternoon teas, lunches, Tuesday night social function and field excursion. Single-day registration is available.

For enquiries please contact:

David Free

phone (076) 881000

fax (076) 881188

Linda Foster

phone (07) 3896 9853

fax (07) 3896 9858

"WAI WHENUA - WATER/LAND". 24th Hydrology and Water Resources Symposium, Auckland, New Zealand. 24-27 November 1997.

The 24th Hydrology and Water Resources Symposium this November will be held in Auckland, New Zealand. It is a combined symposium with the NZ Hydrological Society and the Institute of Engineers, Australia. The call for abstracts has now closed and an excellent response has been received. As a result we have had to expand the programme to incorporate a greater number of presentations.

If you are interested in raising your organisations profile in Australia and New Zealand, organisers are offering Exhibition Spaces and Sponsorship Opportunities. These have only been made available in the past couple of weeks and already some have been booked. If you would like more information about these please contact Bryan Bates, symposium convenor, at

bbates@arc.govt.nz or in New Zealand on 09 3662034 or fax 09 3662155.

If you are interested in this symposium please contact:

HWRS '97, The Conference Company, PO

Box 90-040, Auckland, NZ.

(Phone: 0064-9-360-1240, Fax: 0064-9-360-1242,

Email: info@tcc.co.nz).

International Congress on Modelling and Simulation (MODSIM 97)

Hobart, Tasmania
8-11 December 1997

Special Session: PROCESS INTERACTIONS IN THE NATURAL ENVIRONMENT

Considerable progress has been made in recent years in the modelling of individual environmental processes such as infiltration, surface runoff generation, evaporation, and solute transport. However, a fuller appreciation of the workings of the natural environment requires understanding of the interactions between various processes at a variety of spatial and temporal scales. This session seeks presentations on a combination of modelling and field measurement approaches aimed at gaining insights into process interactions, including space-time dynamics, related to flow and transport in watersheds, rivers, wetlands, lakes and estuaries, with particular emphasis on the ramifications for environmental management.

Convenors: Drs M. Sivapalan (CWR, UWA, Perth) and Tim Green (CSIRO, Perth).

The general congress theme is Spatial and Temporal Dynamics in Physical, Biological and Socio-Economic Systems.

Other hydrologically oriented sessions include:

- Land surface-atmosphere interactions
- Evaluation of surface hydrologic models
- Groundwater flow and transport modelling

International Congress Secretariat (MODSIM 97)

c/- CSIRO PO Box 1538, Hobart, Tasmania 7001, Australia

Fax within Australia: (03) 6232 5000 International Fax: +61 3 6232 5000

Final papers (6 x A4 pages), plus registration for at least one author, are due by 15 August 1997. In addition to the congress proceedings, selected papers will be published in international journals.

For further information on MODSIM 97, registration and Hobart:

Web site: <http://www.ml.csiro.au/modsim97>

Email: MODSIM97@ml.csiro.au

Phone: +61 (0)3 6232 5482

FUTURE GROUNDWATER RESOURCES AT RISK

International Conference

Changchun, P.R. China, 12-16 July 1998

TOPICS

1. Side Effects Related to Groundwater Development in Urban Areas
2. Groundwater Contamination Control and Remediation:
3. Water Resources Development and Eco-system in Arid or Semi-arid Area:
4. Water Resources and Environment in Karst Area:
5. Groundwater Modelling and Information System:
6. Groundwater Monitoring, Management and Protection: .

REGISTRATION FEE

The registration fee will be about USD 300 (for participants from developing countries will be approximately USD 200), which will provide a copy of the proceedings, refreshments during meeting hours, social events and a half-day excursion. The registration fee will not cover the hotel expenses, meals, the accompanying persons program and a three-day post conference excursion.

CONFERENCE SECRETARIAT ADDRESS:

Dr Zhao Yongsheng, Dr Sui Weiguo

FGR'98 Conference Secretariat

P.O. Box 298, Changchun University of Earth Sciences

6 Ximinzhu Street, Changchun, 130026, P.R. China

Fax: +86-431-8928327



International Association of Hydrogeologists XXVII CONGRESS

GROUNDWATER IN THE URBAN ENVIRONMENT

21-27 September 1997 Nottingham - United Kingdom

Conference Nottingham Ltd, Regent House, Clinton Avenue,
Nottingham, NG5 1AZ, U.K. by 31 July 1997.

Tel. Number (0)044) 115 985 6545 Fax Number 0(044) 115 985 6533

T1. Urban Groundwater Processes

Topic Managers: Kevin Hiscock & Paul Younger

Effects of urbanisation on groundwater recharge in the Ruhr	Germany
Isotopic study of groundwater recharge in Yamagata City	Japan
Marker species to establish groundwater impacts in Nottingham	UK
Groundwater recharge in a changing urban environment	Australia
Regional aquitard interactions in Mexico City	Mexico
Unsaturated zone attenuation potential in Cape Flats aquifer	South Africa

T2. Geotechnical Construction Problems

Topic Managers: Shammy Puri & Brian Morris

Impact of groundwater use on historic buildings of Cairo	Egypt/Germany
Rising groundwater: concerns for London's underground infrastructure	UK
Causes and effects of rising groundwater levels in Barcelona	Spain
Modelling groundwater impacts of a new underground railway	Australia
Impact of groundwater on urban tunnelling	Norway
Seepage barrier effect of buried engineering structures	UK

T3. Water-Supply Experiences

Topic Managers: Phil Aldous & Harriet Nash

Rising groundwater in London: its use and control	UK
Causes and consequences of urban water shortage	Yemen
Rise, fall and potential renaissance of the English spa town	UK
Sustainable management of urban aquifers	USA
Modelling of urbanisation effects on coastal phreatic aquifer	Tunisia
Conjunctive use of groundwater for coastal holiday towns	South Africa

T4. Groundwater Pollution Hazards

Topic Managers: Richard Kimblin & John Tellam

Prototype hazard assessment for contaminated land mapping	USA
Impact of leaking sewers on urban groundwater	Germany
Chemical transformations of groundwater beneath unsewered cities	UK
Occurrence and sources of MTBE in groundwater	USA
In-situ reactive wells: a new approach to groundwater clean-up	Germany
Remediation of contaminated land on Yorkshire Coal Measures	UK

T5. Environmental Management & Planning

Topic Managers: Sue Hennings & John Chilton

Planning guidelines for water-sensitive urban development	Israel
Groundwater information systems as tool for environmental management	Netherlands
Assessing the relative protection value of groundwater in Nicaragua	Sweden/Nicaragua
Status and trends of municipal wellhead protection in USA	USA
High-school summer action on protecting urban groundwater quality	Australia
Vulnerability analysis as a tool in municipal planning	Sweden



Centre for Groundwater Studies

The Centre for Groundwater Studies is a cooperative research and education venture focussed on processes affecting recharge, discharge, contamination and remediation of groundwater.

Services Offered

- Specialist Consulting
- Contract Research
- Postgraduate Education
- Specialist Training Courses

The Research



- Sustainability of groundwater resources
- Groundwater contamination and remediation
- Agricultural and urban impacts on groundwater quality
- Water reclamation
- Surface water - Groundwater interaction
- Salinity Management

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Bulgarian Hydrogeologist Seeking Employment

We received correspondence from a Bulgarian hydrogeologist, Dimitar Shterev (37 years of age) enquiring about positions or contacts in Australia. Following is a summary CV including his e-mail address.

ADDRESS: Blvd. Buxtone, Bl. 201-A, Vh.A, ap. 5,
1618 Sofia, BULGARIA.

tel.: (+359-2) 554-414; **tel./faxes:** (+359-2) 250-196 or 376-984.

e-mail: kkourtev@geology.acad.bg

Qualifications: BSc in hydrogeology/engineering geology from University of Geological Prospecting, Moscow, Russia, in 1985. MSc in 1994 from UN University, Reykjavik, Iceland in 1994, in Mining Engineering and Hydrogeology. Plus several UN training programs.

Experience: 1985 - 1991 hydrogeologist with State company Rare Metals, in Sofia hydrogeology of ore deposits and mapping general and geothermal groundwater studies reservoir assessment and modelling
1991 to present Hydrogeology Project Coordinator, St Ivan Rilski University of Mining and Geology mineral waters geothermal reservoirs well testing hydrogeochemistry

Has various publications and technical reports.

MEMBERS MOVEMENTS and NEW ADDRESSES

CHANGE OF ADDRESS

Col. Mackie has left Rust PPK to concentrate on completing a number of personal research and software development initiatives through his company Mackie Environmental Research. He continues to undertake consulting assignments.

NEW MEMBERS

We are pleased to welcome the following new members recently accepted into the IAH.
Congratulations.

MR DF BARCLAY	QLD	MS T J BERGER	VIC
MR M CHARGE	WA	COFFEY PARTNERS	NSW
MR A DURICK	QLD	MR S FORD	VIC
MS S JEREMIAH	VIC	MR M A KAVANAGH	NSW
MR M D MAJOR	WA	MR P I MANNING	WA
MR I D MATTHEWS	NT	MR D J MCALISTER	QLD
MR R MCLEAN	QLD	DR H MOHSENZADEH	WA
MR G MUDD	VIC	MR N OWEN	WA
MR M J PATON	QLD	DR N PRAWOTO	INDONESIA
MS J RIB	WA	DR M SIRAZ	NSW
MS W TIMMS	NSW	MR N WATKINS	SA
MR D WESTERN	WA		

CHANGE OF E-MAIL ADDRESS IN QUEENSLAND

Due to reorganisation (does it ever end) the E-mail address of many Queensland members has changed, including many of the executive. The water component of the Department of Primary Industries was merged with the Lands Department to form the new Department of Natural Resources. E-mail addresses have changed - "dnr" replaces "dpi"
As an example, for John Hillier, his new address is hilliej@dnr.qld.gov.au

CSIRO Division of Water Resources has TOPOG

CSIRO Division of Water Resources' web server now hosts TOPOG Online, a new web site devoted to TOPOG hydrological model. The site is still under construction, however,

- o you can access user manual for TOPOG,
- o send your queries,
- o access list of publications related to TOPOG,
- o download data, and
- o sometime by the middle of this year even download the program code.

The site is located at <http://www.dwr.csiro.au/topog/>

A MESSAGE FROM YOUR FRIENDLY SECRETARY

1997 FEES

Thanks to all of the members that have already sent in the 1997 fees. Unfortunately, some of those who sent in their fees on the 1997 renewal form were in arrears for 1996 (and some for more). The treasurer will be contacting all of the members who are in arrears, and providing them with a statement of their current financial situation. So we are *urging* all of those who are in arrears to dig into their pockets and become up to date.

Remember that fees are now \$90 per year, which is still low for what you get (and its tax deductible).

The parent body of IAH has decided to reduce the time for payment of arrears before expelling members for non payment. In the past, this has ranged up to *three years*, and has resulted in the IAH carrying a large burden, particularly if members in arrears have been getting all of the benefits of IAH membership, then fail to pay.

The policy of the IAH has been that all journals not delivered are returned to the UK to be resent from there. I have requested that the IAH-Australia return address be used for Australian mail, so it at least remains in the country. I believe that some of the notes I have sent to UK about non receipt of journals and books have been successful. If you still are having problems, please contact me again.

Changes of addresses are usually despatched to the UK fairly quickly. There have been a few membership delays due to incorrect or missing information. These are in the minority, especially when you consider the growth in membership over the last few years, and since Queensland took over the running of the Australian Executive at the end of 1994. We are not claiming that it is our leadership that has caused this large rise in membership. We believe it is the general acceptance now that for those in the hydrogeological field there is a professional organisation that is not only international, but which gives good value.

IAH BADGES

These metal badges are available from the Secretary for \$5.00. Please buy one to identify yourself as a member of IAH-International (it is the international shield symbol with water drop). Wear it on your tie, your hat, secretly behind your lapel, blatantly on your motorcycle denim vest, or as a statement of individuality as body jewelery. The national executive are all proud owners of these badges.



**PLEASE BE SURE YOUR FEES AND
ADDRESS/CONTACTS
ARE UP TO DATE**