

Geo-soundings

NEWSLETTER - DECEMBER 2003

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As can be seen from this issue of GEOSOUNDINGS, all members have been very busy this last quarter. Staff and students have attended three major conferences in the USA, Russia and Brazil. A total of 10 papers and 2 posters were presented at these conferences and are listed below. From all reports the booth we had at the SEG conference was a great success, with many new and old contacts being established and renewed. **Mr Dominic Howman** again participated in managing our booth and he is to be congratulated on the high quality posters he helped to produce for this event.

In addition 1 refereed journal publication and 29 public presentations have been given at CRGC and CRC LEME meetings/symposiums. A short course was presented by two of the Department's PhD students and in addition one of our PhD students was invited to participate in this year's Science Meets Parliament session in October. Brief reports are included in this issue.

REFEREED JOURNAL

Sick, C.M.A., **Muller, T.M.**, Shapiro, S.A. and Buske, S., 2003, Amplitude corrections for randomly distributed heterogeneities above a target reflector: *Geophysics*, Vol. 68, No 5, pp 1487-1502.

CONFERENCES PRESENTATIONS



Louise Totten, from the University of Oklahoma, drawing the winner of a bottle of Wolfblass Black Label wine. Congratulations to Jan M. Dodson also from the University of Oklahoma who was the winner.

Brajanovski, M and **Gurevich, B.** 2003, Dispersion and attenuation of P-waves in porous rocks with aligned fractures; Moscow 2003, Internat. Geophys. Conf. Exhib., Russia, 1-4 September.

Brajanovski, M., Gurevich, B. and **Lambert, G.**, 2003, Attenuation and dispersion of compressional waves in porous rocks with aligned fractures: Presented at the 73rd Ann. Internat. Mtg., Soc. Expl. Geophys., 26-31 October.

Brown, L. and **Gurevich, B.** 2003, Frequency dependent anisotropy in saturated porous rocks with aligned fractures: Moscow 2003, Internat. Geophy. Conf. Exhib, Russia, 1-4 September.

Evans, B. and Pauli, A., 2003, The seismic expression of pressure on unconsolidated sand: Presented at the 73rd Ann. Internat. Mtg., Soc. Expl. Geophys., 26-31 October.

Gurevich, B. and **Muller, T.M.**, 2003, Seismic signatures of patchy saturation in poroplastic structures: Moscow 2003, Internat. Geophys. Conf. Exhib, Russia, 1-4 September.

Gurevich, B., Brajanovski, M., Brown, L.J. and **Lambert, G.**, 2003, Frequency-dependent anisotropy, attenuation and dispersion of seismic waves in porous fractured rocks: 8th Cong. Brazil. Geophys. Soc., Rio De Janeiro, Brazil, 14-18 September.

Gurevich, B., Muller, T.M. and **Brajanovski, M.**, 2003, 1-D random patchy saturation model for velocity and attenuation in porous rocks: Presented at the 73rd Ann. Internat. Mtg., Soc. Expl. Geophys., 26-31 October.

Luo, M. and Arihara, N., 2003, 3-D analysis of complex fracture systems: Presented at the 73rd Ann. Internat. Mtg., Soc. Expl. Geophys., 26-31 October.

Urosevic, M., Gerhardt, A. and Dodds, K., 2003, Utilising information from VSP data to improve reservoir characterisation: Moscow 2003, Internat. Geophys. Conf. Exhib., Russia 1-4 September.

Zhang, F., Uren, N. and **Urosevic, M.**, 2003, Anisotropic NMO corrections for long offset P-wave from multi layered isotropic and transversely isotropic media: Presented at the 73rd Ann. Internat. Mtg., Soc. Expl. Geophys., 26-31 October.

CONFERENCE POSTERS

Ciz, R., Siggins, A.F., Dodds, K., Dewhurst, D.N. and Urosevic, M., 2003, Quantitative prediction methodology of different stresses based on seismic attributes derived from experimentally induced overpressure conditions: Poster paper presented at the 73rd Ann. Internat. Mtg., Soc. Expl. Geophys., workshop session, entitled Seismic determination of pressure, saturation and porosity, 26-31 October.

Gerhardt, A., 2003, Estimation of seismic texture orientation: 8th Cong. Brazilian. Geophys. Soc., Rio De Janeiro, Brazil 14-18 September.

PUBLIC PRESENTATIONS

Beckett, K., 2003, Airborne geophysics applied to groundwater modelling: CRC LEME Western Regolith Symposium, Curtin, 27-28 November.

Beshili, S.A. and Urosevic, M., 2003, Reservoir characterisation using seismic anisotropy (NWS) - issues, objectives, work plan: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

Brajanovski, M., Lambert, G. and Gurevich, B., 2003, Attenuation and velocity dispersion in fractured porous rocks: theory and numerical simulations: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December

Brown, L., Gurevich, B. and Sherlock, D., 2003, Frequency dependent anisotropy of fractured porous rocks: theory and laboratory experiments: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

Cantwell, N., 2003, High Resolution geophysical methods for gold exploration under regolith cover, Songang Prospect: CRC LEME Western Regolith Symposium, Curtin, 27-28 November.

Chambers, K., Urosevic, M. and Gurevich, B., 2003, Analysis of fracture induced anisotropy from surface seismic data: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December

Davies, A., Tredrea, B. and Urosevic, M., 2003, Seismic anisotropy in Barrow sub-basin: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

Evans, B., 2003, Pressure chamber applications: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

Evans, B., 2003, Developments in APCRC: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

Gerhardt, A. and Vermeulen, J., 2003, Coherency analysis and how to enhance it: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

Gurevich, B., 2003, Overview of rock physics research: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

Hartley, B., 2003, Overview of signal processing: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December 2003.

Hartley, B., 2003, Seismic with continuous signals: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

Hashemi, A., 2003, HOISTEM EM for exploring under regolith cover: CRC LEME Western Regolith Symposium, Curtin, 27-28 November.

Hunter, D., 2003, Forward modelling surface NMR for hydro geological applications in Australia: CRC LEME Western Regolith Symposium, Curtin, 27-28 November.

Li, R., McKenna, J. and Urosevic, M., 2003, Matlab implementation (GUI) for CRGC developments: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

McDonald, J., 2003, WA energy research alliance: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

Muller, T., 2003, Effect of 3D heterogeneities on transient seismic wave propagation: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

Muller, T., Hardy, B. and Gurevich, B., 2003, Modelling of patchy saturation effects on seismic velocity and attenuation: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

Norvill, M., 2003, Improving geophysical data with sensor arrays: CRC LEME Western Regolith Symposium, Curtin, 27-28 November.

Robertson, C., 2003, Regolith investigations and tree survival in a Eucalyptus plantation: CRC LEME Western Regolith Symposium, Curtin, 27-28 November.

Rosid, M.S. and Kepic, A., 2003, Electrokinetic sounding method to map hydrogeological boundaries: CRC LEME Western Regolith Symposium, Curtin, 27-28 November.

Thompson, T., 2003, Automated event picking in prestack hyperspace: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

Urosevic, M., 2003, Recent developments and their application to exploration issues offshore NWS: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

Urosevic, M. and Fatkhan, F., 2003, Anisotropic AVO modelling: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December 2003.

Watts, A. and Hartley, B., 2003, Numerical modelling of seismic monitoring with a continuous source using an altered medium: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

Wilkes, P., 2003, CRC LEME and environmental applications: CRC LEME Western Regolith Symposium, Curtin, 27-28 November.

Zhang, F. and Uren, N., 2003, Anisotropic semblance analysis and NMO corrections for long-offset data: CRGC Ann. Gen. Mtg., Rottneest Island, 4-5 December.

AWARDS/PRIZES/SCHOLARSHIPS

Brian Evans chaired the RCT7 session (Acquisition and Illumination.) at the SEG Conference held in Dallas, Texas, 26-31 October 2003.

Boris Gurevich chaired the RP3 session (Rock Physics 3) at the SEG Conference held in Dallas, Texas 26-31 October 2003.

Winner of the ASEG Student Night "**Best Mineral/ Environmental Presentation**" awarded to:

Claire Robertson

for her presentation entitled

Tree growth survival and regolith in salt-affected landscapes of Blackwood / Bridgetown area, SW Western Australia

Supervisors:

PG Wilkes, R Harper (CALM) and R Anand (CRC LEME)

Winner of the ASEG Student Night "**Best Petroleum Presentation**" awarded to:

Kurt Chambers

for his presentation entitled

Analysis of fracture induced anisotropy from surface seismic data

Supervisors:

B Gurevich, M Urosevic and K Koster (Woodside)

These awards will be presented to the winners at the ASEG End of Year BBQ/AGM meeting at ARRC on December 3.

SHORT COURSE

Spatial Data for Natural Resource Management Course

The inaugural "Spatial Data for Natural Resource Management" course was held on November 12th to 14th at the Department of Exploration Geophysics. Sponsored by the ASEG, the course demonstrates the benefits of spatial data, including geophysics, for natural resource management. Experts in this field were drawn from CSIRO, UWA and Curtin, including course facilitator **Greg Street** and PhD student **Kirsty Beckett**. Feedback from the course is encouraging with participants indicating they now felt confident to use spatial data, especially geophysical data, in future NRM projects. The course is expected to run again early next year.

CRC LEME PRESS RELEASE

Change of leader for Minerals Exploration and Natural Resource Management CRC

After eight years as Chairman of the Cooperative Research Centre for Landscape Evolution and Mineral Exploration, the highly respected Dr Ross Fardon, is calling it a day.

MR GEORGE SAVELL will take over from Ross in November 2003 and is Chair Designate as from the LEME Annual General Meeting held 5 September.

Mr Savell said it was a great honour to have the opportunity to contribute in a positive way to the work of LEME, particularly as its programs were vital to two of Australia's great industries - Agriculture and Mining.

He said that he welcomed the inevitable challenges which the position would no doubt produce and was committed to positive outcomes.

George Savell is based in Perth, at the 'core' of the country's mining activities. He has only recently retired as CEO of the Association of Mineral Exploration Companies and has been closely involved with a wide spectrum of mineral exploration and mining companies in Western Australia and Australia. His support of the role of geoscience in the community goes back many years.

George also spent five years as the Chairman of the Kings Park Board during which time Kings Park was re-established as a community icon with a critical mass of attractions for the community. George is ideally placed to guide and support the Centre in all facets of its research.

Adapted from the Press release from CRC LEME on 12 September 2003

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SCIENCE MEETS PARLIAMENT

Science Meets Parliament Wednesday 15th October 2003

Each year scientists from across all disciplines gather in Canberra for the annual Science Meets Parliament (SmP) event. Coordinated by the Federation of Australian Scientific and Technological Societies (FASTS), SmP gives scientists a chance to speak directly with politicians to voice their concerns on the future of science in Australia, and serves as a reminder of the important role science and technology plays in Australia's development.

The day before the event, participants were informed of the largest problems facing science in Australia at present, as described in the FASTS publication *Australian Science: Investing in the Future*, and what to expect when speaking with the politicians. Groups of three scientists were allocated 1 or 2 interviews with different politicians, dependent on the field of expertise of the scientist and the areas of interest indicated by the politicians. This year the event saw record attendance with over 200 scientists and over 60% of the federal politicians taking part.

Kirsty Beckett was asked to represent the Australian Society of Exploration Geophysicist at SmP 2003. Kirsty, with fellow scientists Dr John Bradd (ANSTO) and Dr Evelyn Krull (CSIRO Land and Water) met with Western Australian Senator David Johnston. The group occupied a record 2 hours and 15 minutes of the Senator's time. The state of the environment dominated the discussion, from the Kyoto protocols to salinity and carbon sequestration. Other topics included initiatives to encourage the transfer of technological developments into small business and impact of Land Rights on mining and exploration.

Full list of discussion points:

- Kyoto Protocols
- Alternatives to Kyoto
- Future developments of carbon sequestration in soil
- Difficulty of capital raising for new technology business ventures
- Potential grants and incentives to encourage new technology ventures
- State of the environment in Western Australia

- Impediments to farmers in implementing new land management practices
- Poor coordination of salinity management and natural land management issues in WA
- Lack of formal advice centre for land management in WA
- The need for Federal guidance in land management decision making, crossing political borders
- Lack of support structures for young scientists in contract positions
- Generation gap in geosciences, the causes and impact this situation presents
- Australia's "Brain-Drain" and why young scientists are leaving Australia
- Land right issues in Australia and the impact on mining and exploration

INNOVATIVE RESEARCH PROGRAM

Curtin team supports DoIR in technical review of Gorgon

A team of petroleum scientists and engineers performed the independent Technical Review of the proposed Gorgon gas field development for the Department of Industry and Resources (DoIR). Led by Professor Brian Evans of the Department of Exploration Geophysics, the team comprised of Professor Robert Amin and staff from Core Laboratories (Australia).

The Gorgon gas field is operated by Chevron Texaco, and the plans are to bring the gas on to Barrow Island where CO₂ is separated from the incoming gas. Once separated, CO₂ is injected into the saline aquifer which is more than 2 km deep beneath Barrow Island at the proposed injection point, while remaining gas to be processed for commercial use and export is piped to the mainland. The project expects to inject as much as 2.4 TCF (trillion cubic feet) beneath Barrow over 30 years into a reservoir which has the capacity to store it for a long period of time. Reservoir simulations done by Chevron Texaco to date have indicated that storage is stable for at least 400 years and potentially for many years longer.

The Curtin team provided an independent technical review of the proposal to the DoIR, which was then used as the basis for submission to the WA government. Issues such as the environmental impact and quarantine are being resolved, and it is understood that the WA State Cabinet will make a final decision on the project some time during early September.

Both DoIR and CCS were pleased with the professional standard displayed by the Review team, with the Review Recommendations being supported by DoIR. We await publication of the WA Cabinet decision.

WA ERA

Western Australia Energy Research Alliance (WA ERA)

This is an alliance between CSIRO Petroleum, Curtin and the University of WA. The aim of the alliance is to enhance the research & development currently being offered by the ARRC. The intention is to create a world class research centre which would be the first of its kind in SE Asia, similar to research centres in Houston and the Netherlands.

ESCWA

Earth Science Consortium of Western Australia (ESCWA)

This organization involves a Memorandum of Understanding between CSIRO Petroleum, CSIRO Exploration & Mining, Curtin, the WA Museum and the University of WA. The aim of ESCWA is to ensure that geosciences continue to contribute to the growth of the State's economy. It also will aim to establish Perth as world leader in geoscience education, training and research.



*Wishing you a
Joyful Christmas
and
Prosperous New Year.*

*From All the staff and students
Department of Exploration Geophysics.*

