



Geo-soundings

NEWSLETTER – MARCH 2006

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WELCOME

Welcome to the first edition of Geosoundings for 2006 which clearly shows by its contents that all members of the Department have geared up for another busy year. Semester 1 teaching is well underway and as the numbers below indicate, there has been an improvement in this years new undergraduate enrolments. We are also very happy to report on the successful awards and prizes that have been bestowed on our outstanding students and staff.. In addition, this issue highlights some of the interesting research programs that staff are currently involved with. We hope that you enjoy the contents of this edition of **Geosoundings** and we look forward to keeping you informed of our activities throughout 2006.

ENROLMENTS 2006

TOTAL ENROLMENTS FOR 2006 ARE:

BSc (Geophysics) Undergraduate and Honours	75 + 15
BSc (Geophysics)/BSc (Computer Science)	5
BSc (Geology/Geophysics)	19
Graduate Diploma	1
Postgraduate Diploma	1
MSc (Geophysics) – Coursework	1
MSc (Geoscience Exploration) – Coursework	0
MSc (Geophysics) – Research	2
PHD	22

2005 GRADUATES WERE:

Doctor of Philosophy

Troy Thompson

Master of Science (Geophysics) by Coursework

Barrack Ouma

Master of Science (Geoscience Exploration) by Coursework

Mohamed Ould Henoune Lemrabott Mohamed Lemine Taleb

Graduate Diploma in Geophysics

David Mackay

BSc (Geophysics) Honours

Martin Burke Cameron Jones

Daniel Howes Alan Nanini

Jacob Paggi

BSc (Geophysics)

Lee Davey Owen Davis

Matthew Dielesen Russell Eade

Megan Halbert Marshall Hood

Stephen Irvine Kabilan Krishnamurthy

Erik Kristiansen
Kyle Mair
Jacob Smith
Benjamin Wielstra

Alexander Maekivi
Jennie Powell
Paul Wellington

AWARDS/PRIZES/SCHOLARSHIPS/GRANTS

MERIWA Supplementary Scholarships for 2006

The Minerals and Energy Research Institute of Western Australia offers supplementary scholarships each year to postgraduate students undertaking research in the minerals and petroleum field. This year one scholarship has been awarded to **Mr Robert Galvin**, who is undertaking a PhD in the Department of Exploration Geophysics. The scholarship is for one year and will assist Robert to continue his research entitled: *"A Theoretical and Numerical Study of the Elastic Properties of Porous Rocks Permeated by Aligned Fractures"*.

Vice-Chancellor List - Semester 2, 2005

The Department nominated **Mr Owen Davis** as the top geophysics student for semester 2, 2005 to be added to the **Vice Chancellor's List**. This honour is extended to only students in the top 1%.

PESA Elwood Horstman Prize - 2005

Mr. Alan Nanini has been awarded the **Petroleum Exploration Society of Australia Ltd (WA Branch) Elwood Horstman Prize**. This prize is awarded to the best Honours graduate studying in a field related to petroleum exploration. Alan will be presented with this award at the PESA Luncheon meeting to be held on the 20th April 2006.

PESA Best Geophysics Third Year Prize - 2005

Mr. Owen Davis has been awarded the **Petroleum Exploration Society of Australia Ltd (WA Branch) Best Third Year Prize**. This award is to the student who has shown the most potential in petroleum-related subjects and who is likely to pursue a career in the petroleum industry. Owen will also be presented with this award at the PESA Luncheon meeting to be held on the 20th April 2006.

Curtin Developmental Research Grant

The Office of Research and Development at Curtin University has awarded a Curtin Developmental Research Grant to **Professor Boris Gurevich** for a research project entitled *Seismic signatures of wave-induced fluid flow in heterogeneous reservoirs*. This one year grant is valued at \$15,000 and has been awarded for 2006.

2006 KEGS OFFICE BEARERS (MEMBER OF THE SEG STUDENT SECTION)

Following a meeting of the Geophysics student body, elections were held in March to elect the 2006 KEGS Committee. The results are as follows:

PRESIDENT: Mr Matthew Little
VICE-PRESIDENT: Mr Cornelious Keoagile Tshitlho
SECRETARY: Mr Matthew Saul
TREASURER: Mr Andrew Meng Leong Pethick
GENERAL COMMITTEE MEMBERS:
Mr Christopher Semeniuk
Mr William Scott
Mr Sean Phillips

FACULTY ADVISOR:

Prof Brian Evans Phone: +618 9266 7092
Email: Brian.Evans@geophy.curtin.edu.au

CONFERENCE PRESENTATIONS

Street, G., Abbott, S., and Beckett, K., 2006, *Digital soil mapping in Harvey irrigation area, Western Australia*; Presented at the 11th Congress of Soil Science, March 28-31, Islamabad, Pakistan

Street, G., Abbott, S., and Beckett, K., 2006, *Digital soil mapping using near surface geophysical techniques*; Presented at the 11th Congress of Soil Science, March 28-31, Islamabad, Pakistan

Street, G., and Harrison, A., 2006, *Groundwater recharge mapping using airborne radiometric data in the Bengowrden catchment, Southeast Australia*; Presented at the 11th Congress of Soil Science, March 28-31, Islamabad, Pakistan

PUBLIC PRESENTATIONS

Evans, B., *A review of mining education and coal research*; Presented at the Australian Coal and Mining Forum, February 2, Delhi, India

JOURNAL PUBLICATIONS

Galvin, R., and Gurevich, B., *Interaction of an elastic wave with a circular crack in a fluid-saturated porous medium*; Applied Physics Letters, Volume 88, February 2006

Muller, T., and Gurevich, B., *Effective hydraulic conductivity and diffusivity of randomly heterogeneous porous solids with compressible constituents*; Applied Physics Letters, Volume 88, March 2006

INNOVATIVE RESEARCH

Centre for High Definition Geophysics

Activity in the new Centre of Excellence in High Definition Geophysics (CHDG) has commenced with more than three research projects. The first of these projects was with Sydney Gas to evaluate the use of a Minivibe source (from ANSIR) in the Sydney Basin in both P- and S-wave imaging. Data quality from the P-wave survey using the Centre's new seismic system was excellent and initial results from the S-wave survey is also very encouraging. A project with Independence Group on Lake Lefroy demonstrated our prowess in acquiring seismic reflection data in a tricky environment. Small explosive sources and the portability of the new seismic system provided high quality data in an area normally avoided, due to access problems. A recent project with the Beverly Uranium Mine demonstrated the potential of seismic reflection methods to assist with delineating hydro-geological targets as the mine uses an in-situ leach system to extract the uranium. Initial trials were successful despite the weak seismic source and high ambient noise. Imminent projects in the pipeline are to assist both gold and base-metals exploration, and to define both deep and near-surface water resources.

The new 120 channel seismic system purchased for the CHDG has performed admirably in providing exceptional data. However, demand has outstripped capacity and the system is being upgraded to become a 320 channel system, or, two 160 channel systems by

May 2006. Additionally, the system will have a new accelerated weight drop seismic source to complement the existing sources used in acquisition. To complement our precision seismic system a precision DGPS navigation system is also being purchased to assist in precisely locating geophones and shotpoints.

MERIWA 363 Project

The largest ever MERIWA project (M363) conducted by the Department of Exploration Geophysics (Milovan Urosevic and Brian Evans) has come to an end and in essence, it will continue in an expanded form through the new Centre of Excellence for High Definition Geophysics (CHDG). Several new research positions will be provided through the CHDG as well as one PhD scholarship. In addition, new hardware upgrades, necessary for CHDG operations have been acquired (*see previous topic*). The state-of-the-art seismic network acquisition system will be available in 2-3 weeks time. The initial capacity of this highly portable system is 326 channels. Apart from our first proto-type of DC EM mini vibrator (developed in house) we will soon acquire a 45kg accelerated weight drop source which will be used for exploration of up to 1 km deep targets. A real-time differential GPS system is also being acquired. With this new sophisticated equipment the Department will be capable of conducting single and multi-component experimental surveys, deploying standard and complex field layouts, without clearing requirements.

Rural Towns – Dowerin Survey

A second seismic reflection survey has been completed for the Rural Town Liquid Assets project. The 800m long transect was completed along the main street in Dowein. Dowerin is a wheat farming town about 200kms NE of Perth. The survey will form to recover near surface (top 100m) hydrogeology. The results will be used to assist in targeting pumping bores these are needed to control rising water tables that can damage major assets within Dowerin (e.g. road, the wheat handling facility etc). The picture below shows the seismic line layout along the railway in front of Dowerin's wheat handling facility. The data is currently being processed in preparation for hydro geological interpretation.



Figure: Location of high resolution seismic reflection transect in Dowerin

NEW STAFF

Welcome to the first of our new staff members associated with the CHDG, who has recently joined the Department. **Dr Andrew Squelch** is a joint appointed with the IVEC Centre. Andrew will be assisting with the translation of geophysical data into the realm of 3-D geological models. Additionally, Andrew has a mine engineering background and will assist in developing opportunities to use geophysical methods in mine geotechnical issues.

UPCOMING EVENTS

The Department of Exploration Geophysics will be represented at the following events. Feel free to visit our booths, as we would love to speak to you.

CAREERS AND EDUCATION EXPO, Perth Convention Centre - **May 19-21**

EUROPEAN ASSOCIATION OF GEOSCIENTISTS AND ENGINEERS, 68TH CONFERENCE AND EXHIBITION, Vienna - **June 12-15**

AUSTRALIAN EARTH SCIENCES CONVENTION, Melbourne Convention Centre - **July 2-7**