EAGE

EUROPEAN ASSOCIATION OF GEOSCIENTISTS & ENGINEERS

First EAGE Workshop on Faults in Groundwater, CO_2 and Hydrocarbons in Asia Pacific

24-25 AUGUST 2021 • ONLINE

- **Programme**

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TECHNICAL COMMITTEE

Titus Murray (Chairperson)	Southern Highlands Structural Geology
Amitava Ghosh	Baker Hughes
Bill Power	Consultant
Bronwyn Cammac	Consultant
Mark Smith	Consultant
Dave Dewhurst	CSIRO
Wendy Timms	Deakin University
Andrew Stacey	Department of Agriculture, Water and the Environment
Alex Bruce	Empire
Eric Tenthory	Geoscience Australia
Tim McMillon	Pells Sullivan Meynink (PSM)
Suriani Sulaiman Mustahim	PETRONAS
Gary Ingram	SapuraOMV
Arjan Brem	Shell
Scott Mildren	Tech Limit
Stephen Tyson	Universiti Teknologi Brunei
Jim Underschultz	University of Queensland

EVENT OVERVIEW

Geologic faults and fractures are a feature of significant uncertainty for a wide range of geologic endeavours. The study of fractures and faults for mineral systems has been investigated for more than a hundred years. The oil and gas industries have been actively studying fault sealing processes over the past 50 years. Hydrogeology has developed an extensive understanding of near-surface aquifer processes. In most cases, these activities are profit-motivated.

A significant part of these endeavours has been focused on exploiting fluid flow. In the more recently there has been a pivot to the containment of fluids, gases, salts and particles. In the cases of radioactive waste disposal, groundwater pollution, CO2 sequestration and saline water disposal; the science of seals and flow is now the basis of legal and regulatory frameworks.

In this distributed workshop, we will be exploring the impact of structural features on fluid flow. In particular, working with case-studies from a wide range of extractive industries, including:

- Geothermal Exploration and Development
- Groundwater Leaching Operations
- Role of Faults in Groundwater Environmental Impact Assessment
- CO2 Sequestration
- Radioactive Waste Disposal
- Conventional Oil and Gas
- Unconventional Oil and Gas

Remarks by Titus Murray, Event Chairman

"Faults have been studied for hundreds of years for mineral systems. The oil and gas industry has looked at fault-seal for more than 50 years. Recently, there has been a pivot to study the containment of fluids, rad-waste, pollutants and CO2. The science of faults and flow is now the basis of legal and regulatory frameworks. In this virtual meeting, a range of talks will explore the impact of faults on containment and flow. Keynotes will provide a review of the development of fault seal/flow science. Panels will lead discussions on what we can and can't say about faults."

KEY PRESENTERS

Keynote Presenters

Scott Mildren,
Managing Director,
Tech Limit Pty Ltd

Thomas Manzocchi,
Associate Professor,
University College Dublin

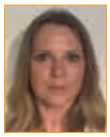
Des Fitsgerald,
Principal,
Desmond FitzGerald & Associates Pty Ltd,
t/a Intrepid Geophysics

Neil Grant,
Specialist Geologist,
ConocoPhillips UK Holdings Ltd.

Sherilyn William-Stroud,
Research Scientist,
Illinois State Geological Survey

Ralf Oppermann,
Independent Geoscience Consultant,
OPPtimal Resource Solutions Pty Ltd

Christie Rogers,
Reservoir & Trap-scale Structural Geologist,
ExxonMobil



Signe Ottesen,
Senior Specialist - Geology,
Equinor

Thomas Doe,
Principal,
Golder Associates Inc.

Cindy Ong,
Principal Research Scientist,
CSIRO Energy

Stephen Tyson,
Chair Professor,
Universiti Teknologi Brunei

Wendy Timms,
Chartered Professional Engineer,
Deakin University

Panel Presenters

Richard Creswell,
Discipline Lead - Water,
Eco logical Australia

Wendy Timms,
Chartered Professional Engineer,
Deakin University

Wayne Bailey,
General Manager Geoscience,
Woodside Energy Ltd

Doug Peacock,
Technical Director,
GaffneyCline

Gary Ingram,
Head of Exploration and Appraisal,
SapuraOMV

Chris Consoli,
Senior Consultant - Storage,
Global CCS Institute

Laurent Langhi,
Geologist,
CSIRO Energy

Nick Hoffman,
Geoscience Advisor,
CarbonNet

TECHNICAL PROGRAMME

This event will be conducted as per Canberra time (UTC +10)
The programme is confirmed as of publishing date and may be subject to change without prior notice.

Keynote Presentations | Tuesday 24 August

DAY 1	
Opening Remark	
08:45	**Welcome Remarks -** T. Murray[1] [1]Southern Highlands Structural Geology
09:00	**Keynote 1: Faults as Multi-Fracture, Multi-Porosity Hydraulic Systems -** T. Doe[1] [1]Golder Associates Inc.
09:30	**Keynote 2: Fault Juxtaposition and Trap Controls on Original Hydrocarbon Contacts -** C. Rogers[1] [1]ExxonMobil
10:00	**Keynote 3: Enhanced Structural Interpretation Using Seismic Data at the Decatur, Illinois -** S. Williams-Stroud[1] [1]Illinois State Geological Survey
10:30	**Session Break**
10:50	**Keynote 4: Fugitive Methane Emissions Related To Australian Onshore Gas Operations -** C. Ong[1] [1]CSIRO Energy
11.20	**Keynote 5: Evolving Structural Permeability Analyses for a Net Zero Emission Future -** S. Mildren[1] [1]Tech Limit Pty Ltd
11:50	**Lunch**
13:20	**Keynote 6: Small-Scale Faults and Fluid Flow – A New Understanding Emerges -** R. Oppermann[1] [1]OPPtimal Resource Solutions Pty Ltd
13:50	**Keynote 7: Faults in Groundwater Using AEM 2.5D+ Inversion Technology -** D. Fitsgerald[1] [1]Intrepid Geophysics
14:20	**Session Break**
14:40	**Keynote 8: 30 years of flow simulation, geological modeling and upscaling - Are we making any better decisions? -** S. Tyson[1] [1]Universiti Teknologi Brunei
15:10	**Keynote 9: Representation in Flow Models of Faults in Porous Clastic Sequences: Insights from the Conventional Hydrocarbons Sector -** T. Manzocchi[1] [1]University College Dublin
15:40	**Keynote 10: How Faults Influence the Trapping of Oil and Gas -** N. Grant[1] [1]ConocoPhillips UK Holdings Ltd.
16:10	**Keynote 11: Evaluation of Fault Seal for Co2 injection in the Norwegian Northern Lights CCS Project -** S. Ottesen[1] [1]Equinor Norway
16:40	**End of Day 1**

Keynote Presentations & Panel Discussions
Wednesday 25 August

DAY 2	
EIS Groundwater	
09:00	**Keynote 12: Characterisation and Modelling of Geological Fault Zones -** W. Timms, Deakin University
09:30	**Panel Discussion -** W. Timms[1]*, R. Cresswell[2]*, M. Lesueur[3]*, E. Frery[4]*, T.Poulet[4]*, J. McCallum[5]* [1]Deakin University; [2]Eco Logical Australia Pty Ltd; [3]University of Western Australia, Duke University; [4]CSIRO Mineral Resources; [5]The University of Western Australia
11:00	**Lunch**
Oil and Gas Exploration Risking	
12:30	**Panel Discussion -** W. Bailey[1]*, D. Peacock[2]*, G. Ingram[3]*, T. McMillan[4]*, W. Power[5]*, M. Smith[6]*, T. Murray[7]* [1]Woodside Energy Ltd; [2]Gaffney, Cline & Associates (GCA); [3]SapuraOMV Upstream; [4]Pells Sullivan Meynink (PSM); [5]Power Geoscience Pty Ltd; [6]Quantiseal Pty Ltd; [7]Southern Highlands Structural Geology
14:00	**Break**
Co2	
14:20	**Panel Discussion -** L. Langhi[1]*, N. Hoffman[2]*, C. Consoli[3]*, D. Dewhurst[4]*, E. Tenthorey[5]*, Z. Q. Xue[6]*, M. Rajabi[7]*, Y. Nuwara[8]* [1]CSIRO; [2]CarbonNet; [3]Global CCS Institute; [4]CSIRO Energy; [5]Geoscience Australia; [6]Research Institute of Innovative Technology for the Earth; [7]The University of Queensland; [8]Department of Geophysics in Bandung Institute of Technology, Indonesia
Closing Remarks	
15:50	**Closing Remarks -** T. Murray[1] [1]Southern Highlands Structural Geology
16:00	**End of Day 2**

TECHNICAL PRESENTATION

(available online from 10th August onwards)

4. Role of Faults in Deep Connections Between Aquifers and Unconventional Resources, Beetaloo Sub-Basin, NT - E Frery[1]*, J Markov[1]
[1]CSIRO Energy

5. Seal Capacity Evaluation of CO2 Storage in Carbonate Reef Reservoirs using Equivalent Grain Size Method - Y Nuwara[1]*, K Nakayama[2], K Augusta[1]
[1]Department of Geophysics in Bandung Institute of Technology, Indonesia; [2]GeoResearch Nakayama

6. Calibrating Fault Seal and Leakage Element Distribution, Permeability and Threshold Pressure Models to Complex Faulted Fields - M Smith[1]*, J Parsons[1]
[1]Quantiseal Pty Ltd

9. Simulating Fluid Flow Across Scales in Faulted Media Including Fault Cores and Surrounding Damage Zones - T Poulet[1]*, U Kelka[1], M Lesueur[2]
[1]CSIRO Mineral Resources; [2]University of Western Australia, Duke University

12. Origin and Influence of the Asymmetry of the Permeability Tensor in Fracture Networks - M Lesueur[1]*, A Guevel[2], M Veveakis[2], E Fried[3]
[1]University of Western Australia, Duke University; [2]Duke University; [3]Okinawa Institute of Science and Technology Graduate University

16. Simulating the Effects of Faults on Groundwater Flow - J McCallum[1], S Noorduijn[2], C Simmons[2]
[1]The University of Western Australia; [2]Flinders University

17. Fault Stability Monitoring with Distributed Fiber Optic Strain Sensing: Insights from the Lab-Scale Geomechanical Study - Z.Q Xue[1]*, R Amer[1], Y Zhang[1]
[1]Research Institute of Innovative Technology for the Earth

18. Assessment of Fault Reactivation and seabed Uplift Potential from CO2 Injection in the Petrel Sub-Basin - D Dewhurst[1]*, Y H Zhang[2], P Schaubs[2], L Stalker[1]
[1]CSIRO Energy, [2] CSIRO Mineral Resources

20. The CO2CRC Otway Shallow Fault Project: Understanding CO2 Migration through a Strike-Slip Fault - E Tenthorey[1]*, J E-King[2], C Green[2], L Q Wang[1]
[1]Geoscience Australia; [2]CSIRO

21. Geomechanical Considerations for Underground Hydrogen Storage and Utilisation - M Rajabi[1]*, S Mildren[2], S Holford[2]
[1]The University of Queensland; [2]The University of Adelaide

22. Management of Structural and Containment Uncertainties for the South West Hub CCS Site Development - L Langhi[1]*, L Ricard[1], J Strand[1]
[1]CSIRO

23. Fault Propagation Folding of a Braided Chanel Dominated Sandstone Succession - T McMillan[1]*, T Murray[2], W Timms[3], M Andersen[4]
[1]Pells Sullivan Meynink (PSM); [2]Southern Highlands Structural Geology; [3]Deakin University; [4]University of New South Wales

24. A Review of Reproducibility and Cognitive Bias in Fault Hydrogeology - T Murray[1]*, W Power[2]
[1]Southern Highlands Structural Geology; [2]Power Geoscience Pty Ltd

25. Fault Seal in the Perth Basin – Hanging Wall and Footwall Traps - W Power[1], T Murray[2]*
[1]Power Geoscience Pty Ltd; [2]Southern Highlands Structural Geology

IMPORTANT DATES

Official Event	24-25 August 2021
Online Presentation Preview	10-23 August 2021
Online Registration Deadline	20 August 2021

ACCESSING THE VIRTUAL EVENT

The virtual event will be hosted on the Event OnAir platform. A few days prior to the event day, all registered attendees will receive an Attendee Pack via email which will consist of the event guidelines and virtual lobby login link to join the event. All attendees are advised to follow the event guidelines for optimal event experience.

REGISTRATION

REGISTERED AND PAID	
EAGE Member	€250
Non-Member	€350
EAGE Student Member	€125
Student Non-Member	€150

Members please note:

- To qualify for the member registration fee, your EAGE membership dues for 2021 must have been paid and confirmed. The processing time for membership applications or renewals is 10 working days.
- To qualify for the reduced student registration fee:
  - Students must be enrolled in a full time study programme at a recognized university or institute
  - The registration must be accompanied by a copy of a student ID card and/or official proof of enrolment
- The non-member fee includes EAGE membership for the remainder of 2021. This membership will be activated shortly after the event.
- Student non-members cannot be older than 34 years of age (when registering).
- EAGE registration fees differentiate between EAGE members and non-members. In the table above you can see what the different fees are.
- All fees are in Euros (€). One Euro of your total registration fee is donated to the EAGE Green Fund.

SPONSORSHIP OPPORTUNITIES

You may sponsor First EAGE Workshop on Faults in Groundwater, CO2 and Hydrocarbons in Asia Pacific and get high visibility in a qualitative and uncluttered environment that makes your message stand out. Virtual sponsorship opportunities are available!

For information on sponsorship packages, please contact EAGE Asia Pacific office at asiapacific@eage.org.

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