

australian groundwater school

A RIGOROUS INTRODUCTION TO GROUNDWATER SCIENCE AND MANAGEMENT

DID YOU KNOW?

Groundwater makes up about 17% of Australia's accessible water resources, and up to 30% of our water consumption in certain regions. Droughts and climate change place pressure on our critical groundwater reserves; therefore, it is important that Australia has a well-informed workforce that is ready to tackle these challenges.

WHY IS THIS COURSE IMPORTANT?

The Australian Groundwater School is vital for Australian professionals working with groundwater. Our flagship course, and the premier course of its type in Australasia, the Australian Groundwater School provides participants with a broad but rigorous introduction to groundwater.

Introducing hydrogeology, assessment methods, modelling, managed aquifer recharge, management, governance and more, the course truly encompasses the fundamentals of groundwater. Now in its 48th year, we've refreshed the Australian Groundwater School by including a networking session and more tutorials than ever before.

WHO SHOULD ATTEND?

The Australian Groundwater School is an intermediate-level course designed to build on our Groundwater Essentials courses. Scientific, policy and management personnel who want to gain a solid grounding in groundwater should strongly consider attending this course.

WHO IS PRESENTING?

Lectures, demonstrations and tutorials are given by leading groundwater professionals. Our presenters are experienced hydrogeologists and specialists in both public and private practise, from industry, universities and research agencies.

WHAT WILL THE COURSE COVER?

The full schedule for this course is provided on the following pages.

IS IT ACCREDITED?

Participants can apply for accreditation through Flinders University, and can count the Australian Groundwater School towards a range of degrees. Contact renee.spinks@flinders.edu.au for more information.

HOW TO REGISTER

W: www.groundwater.com.au

E: industrytraining@groundwater.com.au

P: (08) 8201 5632

DELIVERED IN PARTNERSHIP WITH:



National Centre for
Groundwater
Research and Training

COURSE DETAILS

MELBOURNE

18–21 March 2013

Mercure, Treasury Gardens
13 Spring Street,
Melbourne, VIC

BRISBANE

24–27 June 2013

Hotel Urban
345 Wickham Terrace,
Brisbane City QLD

COURSE FEES

AU \$2400 (incl. GST)

This includes notes, classroom teaching, tutorials, morning and afternoon teas and lunches. Attendees must bring their own calculator.

Also included is a complimentary copy of the hydrogeology textbook *Groundwater* by R Allan Freeze and John A Cherry.

Attendees are to arrange their own travel and accommodation.

education from the ground up

Schedule

| Day 1 | |
|-------|--|
| 8:30 | Registration |
| 8:45 | Welcome |
| 9:00 | The Importance of groundwater In Australia <ul style="list-style-type: none"> • What is groundwater • The hydrologic cycle • Australian groundwater facts and figures • Australian aquifer map: sedimentary basin/fractured province, inset on map |
| 10:00 | Introduction to hydrogeology <ul style="list-style-type: none"> • What is hydrogeology and its history? • Where is groundwater found? • Factors affecting groundwater • Introduction and examples of aquifer types |
| 11:30 | Morning tea |
| 11:45 | Groundwater hydraulics <ul style="list-style-type: none"> • Water table and capillary zone • Aquifers & aquitards • Groundwater flow systems |
| 12:45 | Lunch |
| 1:45 | Groundwater hydraulics <ul style="list-style-type: none"> • Physical and hydraulic parameters • Hydraulic head • Groundwater flow & Darcy's Law • Storage in aquifers |
| 3:00 | Afternoon tea |
| 3:15 | Groundwater hydraulics <ul style="list-style-type: none"> • Groundwater flow equations • Borehole pumping tests • Single borehole test • Lab measurements of hydraulic conductivity |
| 5:00 | Day 1 concludes |

| Day 2 | |
|-------|---|
| 9:00 | Surface water – groundwater interactions <ul style="list-style-type: none"> • Introduction to surface water hydrology • Locations and modes of interaction between surface water and groundwater • Water balance • Human impacts |
| 10:30 | Recharge/discharge determination <ul style="list-style-type: none"> • Definitions of recharge/discharge • Recharge and discharge estimations methods • Australian case studies |
| 10:45 | Morning tea |
| 11:45 | Groundwater dependent ecosystems <ul style="list-style-type: none"> • Introduction and definition • Types of GDEs • Hydrogeological framework • Methods and indicators used in determination of GDEs • Level of dependency |
| 1:30 | Lunch |
| 2:15 | Tutorial <ul style="list-style-type: none"> • Pump test analysis • Water budget |
| 3:00 | Afternoon tea |
| 3:15 | Tutorial <ul style="list-style-type: none"> • Constructing a water table contour map • Conceptual model |
| 5:00 | Day 2 concludes |

Schedule

| Day 3 | |
|-------|--|
| 9:00 | Groundwater chemistry <ul style="list-style-type: none"> • Why study groundwater chemistry? • Physical and chemical composition of GW • Origin of solutes, evolution in groundwater • Field parameters |
| 10:00 | Environmental isotopes in groundwater <ul style="list-style-type: none"> • What are isotopes and their use? • Types of isotopes • Australian examples |
| 11:00 | Morning tea |
| 11:15 | Groundwater modelling <ul style="list-style-type: none"> • What is a model and what is its purpose? • Modelling process and development • Types of groundwater models • Modelling guidelines |
| 12:15 | Mining hydrogeology <ul style="list-style-type: none"> • Mine Dewatering • Dewatering Methods • Impacts of dewatering • Design of dewatering system |
| 1:15 | Lunch |
| 2:00 | Fractured rock aquifers <ul style="list-style-type: none"> • Fractured rock provinces in Australia • Classification • Basin Characteristics • Groundwater flow • Locating and mapping fractures |
| 3:00 | Afternoon tea |
| 3:15 | Managed aquifer recharge <ul style="list-style-type: none"> • What is MAR and what is it for? • MAR structure types • Water sources to MAR • Water uses • Advantages and disadvantages • Potential for groundwater contamination |
| 4:30 | Open discussion |
| 5:00 | Day 3 concludes |

| Day 4 | |
|-------|---|
| 9:00 | Groundwater contamination <ul style="list-style-type: none"> • Introduction and definitions • Sources of contamination • Fate of contaminants in the sub surface • Groundwater remediation |
| 10:00 | Groundwater microbiology <ul style="list-style-type: none"> • Introduction to microbiology • Pathogens in groundwater • Microbial metabolism in groundwater • Bioremediation |
| 11:00 | Morning tea |
| 11:15 | Salinity and water logging <ul style="list-style-type: none"> • What is salinity and why is it a groundwater issue • Primary and secondary salinity & its sources • Dryland and Irrigation salinity, water logging • Impacts and management of salinity |
| 12:15 | Groundwater management <ul style="list-style-type: none"> • What, why, when and how we manage GW? • Principals • Tools for groundwater management • Management issues • Climate change |
| 1:15 | Lunch |
| 2:00 | Groundwater governance – water law <ul style="list-style-type: none"> • Development of water law in Australia • Alternative approaches to groundwater governance • Trade offs • Water trading, allocation |
| 3:00 | Afternoon tea |
| 3:15 | Social dimensions of groundwater management <ul style="list-style-type: none"> • Why is social research important? • Adoption of new practices by landholders • Social construction of risk • Landholder responses to climate change |
| 4:30 | Open discussion |
| 5:00 | End of course wrap up and evaluation |