

TITLE: 3D Aquifer Modelling

INSTITUTION: Groundwater Unit, Bureau of Meteorology, 700 Collins Street, Docklands, VIC 3008

SUPERVISOR NAMES: Eloise Nation and Champika Wethasinghe

RESEARCH FOCUS: 3D modelling of a geological basin for use in the Australian Groundwater Explorer

RESEARCH BACKGROUND:

Under the *Commonwealth Water Act 2007* the Bureau is required to 'collect, hold, manage, interpret and disseminate Australia's water information', including groundwater data. The *Water Regulations 2008* established the requirements for agencies to send their data to the Bureau, including bore and borehole data, water levels and pressure, salinity and pH, licensed entitlements and groundwater extractions. The Bureau also manages data outside of the regulations, including management areas, aquifer boundaries and 3D aquifer models.

To manage these datasets and clearly disseminate information to the public, the Bureau developed the *Australian Groundwater Explorer*. This is an online product which is used by technical and GIS specialists to visualise bore data and supporting information from the *National Groundwater Information System*. It makes nationally consistent groundwater information easily accessible for users, and has built community confidence in national groundwater management.

As part of the *Australian Groundwater Explorer*, the Bureau has been developing 3D aquifer models for a number of geological basins around the country. These models, presented as downloadable interactive PDFs, provide users with an effective visualisation tool to improve understanding of Australia's hydrogeology. For further information, check out <http://www.bom.gov.au/water/groundwater>

RESEARCH PROJECT PROPOSAL:

The successful applicant will be involved in developing a 3D aquifer model for a particular geological basin in Australia. The completed model will be added to the *Australian Groundwater Explorer* during the June 2018 product update. Specific tasks with outcomes will be given to the student with a timeline. He/she will learn how to follow work processes to develop an understanding of the basin hydrostratigraphy and create a conceptual model for the basin using the *National Aquifer Framework*. The student will also work with a variety of spatial data, including vector and raster datasets, to generate 3D layers such as georasters and geovolumes using ArcGIS. These layers will be used to create an interactive 3D PDF using specialised 3D software. The student will seek review of their conceptual model and 3D datasets, by liaising with local experts specialising in the study region.

This project will help the student understand how groundwater information is managed in Australia, and gain an appreciation for the use of spatial science in effectively representing complex 3D geological data.

The successful applicant will satisfy the following criteria:

- Keen interest in geology and/or hydrogeology, and spatial science
- Well-developed analytical skills
- Sound written and verbal communication skills
- Experience using ArcGIS or similar GIS software package

NUMBER OF STUDENTS: One

PLACEMENT

This placement opportunity would suit students with a background in geology/hydrogeology and spatial science including the use of GIS software. Placement will occur on either a full-time or part-time basis, at the Bureau of Meteorology building in the Melbourne CBD, Docklands. Flexible work dates and hours are available to suit student requirements. Placement is preferred to take place between mid-January and mid-March 2018 (approximately 70 hours work in total). Please note that this placement is strictly on a volunteer/unpaid basis.

Science Industry Placement Program Application Form

For more information visit <http://monash.edu/science/current/undergraduate/getting-the-most/sipp/sipp-main.html>

All applications to be lodged in electronic form only, emailed to sci-sipp@monash.edu

Personal details - Please type or write legibly

Student ID number

Surname _____

Given Names _____

Date of Birth _____ / _____ / _____

Postal Address for correspondence _____

Student email address _____ @student.monash.edu

Home Phone number _____ Mobile number _____

Course details

Course Name _____ Course Code _____

Major _____ Minor _____

Course Start Date _____ Current Year of Study _____

Expected completion date _____

Project details

Industry partner name Groundwater Unit, Bureau of Meteorology

Project title 3D Aquifer Modelling

Dates available _____ *e.g. 6 January – 6 March 2018*

Working hours available _____ *e.g. 9 am – 5 pm daily*

Meeting placement requirements

What units have you completed that will make you a suitable candidate for the project?

What attributes do you have that will make you a suitable candidate for the project?

Supporting documentation (please attach following documents with your application and tick box below)

- Curriculum Vitae of no more than 3 pages.
- Statement of results (download from WES--official versions are not necessary).

Eligibility**Eligibility Criteria**

To be selected for the Science Industry Placement Program, you need to meet the following criteria:

- Be currently enrolled in a Faculty of Science course, must have completed at least 48 credit points and have no more than 48 credit points remaining in the course; and
- Demonstrate a preparedness and capacity to complete a minimum of 30 hours or a maximum of 80 hours placement at an industry partner organisation without compromising their other science studies; and
- Demonstrate work readiness (i.e. we are looking for evidence of personal qualities which equip you to function appropriately and autonomously in a professional work environment).

Selection Criteria

The selection criteria are the 'best fit' match between your enrolled course, units you have completed, interest and experience with the particular project requirements. The industry partner has the final decision. Applicants who are closer to completing their course will be given priority if they meet the 'best fit' match. Please visit the projects section to view the projects available. The webpage will be updated as project proposals are submitted by the industry partners.

Privacy

The information on this form is collected for the primary purpose of applying for the Science Industry Placement Program which includes deciding whether the application will be granted and sending related correspondence. If the form is incomplete, it may not be possible for the Faculty to process the application. The information provided by the applicant in this form, curriculum vitae and academic may be provided to the industry partner of the project in the event that the student is provisionally matched with that industry partner in order for the industry partner to assess the application.

All information for the application of the Science Industry Placement Program is managed in accordance to the [University's Privacy Policy](#). If you wish to access or inquire about the handling of your personal information contact the University Privacy Officer: Privacyofficer@adm.monash.edu.au

Applicant's Declaration

I am enrolled in a course belonging to the Faculty of Science and have completed at least 48 credit points and will have no more than 48 credit points remaining to complete	YES / NO
I can commit to completion of a minimum of 30 hours or a maximum of 80 hours as required by the industry partner without compromising my studies	YES / NO
I have addressed the selection criteria including my suitability and match to the agency/ies and the project/s offered by those agencies in my cover letter	YES / NO
I understand that no salary will be paid for the industry placement and Monash University holds no responsibility for any allowance agreement between the industry partner and the student.	YES / NO

On signing the Science Industry Placement Program application form I agree:

- 1) That I meet all of the eligibility criteria for the Science Industry Placement Program.
- 2) To represent Monash University in a manner that does not compromise the integrity, reputation or relationship of the University and Faculty with the participating industry partners in any way.
- 3) That information provided by me in this form, my curriculum vitae and academic transcript may be provided to the industry partner in the event that I am provisionally matched with that industry partner in order for the industry partner to assess my application.

Student Declaration

I declare that the information provided on this form and the information given to support my application is correct and complete.

I acknowledge that Monash University, Faculty of Science reserves the right to vary or reverse any decision on the basis of incorrect or incomplete information.

Student signature _____
 Received by (print) _____

Date _____
 Date _____