

Raising the profile of groundwater

 **Water Engineering Australia, National**, General News, **Nikki Harrington**

01 Nov 2014

Page 24 • 1121 words • ASR AUD 5,990

Photo: Yes • Type: News Item • Size: 1,841.00 cm² • National • Australia • Press • ID: 352070223



by Nikki Harrington The National Centre for Groundwater Research and Training (NCGRT) is one of the largest and most respected research organisations of its kind in the world, connecting over 200 Australian and international researchers and pooling the hydrogeological expertise of more than 29 Australian universities and partner organisations. The centre's key objectives are to provide scale and focus to Australia's groundwater research effort, building research capacity and delivering nationally significant science outcomes to safeguard the country's economic, environmental and social sustainability.

Centre director, Prof Craig Simmons, said "raising public awareness of the critical importance of Australia's groundwater resources has been one of the centres main areas of focus since its establishment in 2009".

As part of this process the centre has published the Groundwater in Australia report that brings together the available data, statistics and maps describing the importance of Australia's groundwater resources in a readily accessible format. It follows on from the National Water Commissions 2012 Groundwater Essentials booklet which explains what groundwater is, how it interacts with the environment and what the future challenges are.

This new report is aimed largely at people with some understanding of groundwater and would like a general overview of the resource at a national scale or some facts and figures to use as discussion points. To quote directly from the report: "Groundwater is one of Australia's most important natural resources. It is a major source of water for urban areas, agriculture and industry. For many regions it is the only source of water available - numerous townships, farms and mines are totally reliant on groundwater. Many ecosystems, including some of our most iconic, depend on groundwater to sustain them. The importance of groundwater is most pronounced in Australia, which is the driest inhabited continent on Earth and where surfacewater resources are limited over vast areas."

Groundwater in Australia also notes that despite its importance, groundwater is often undervalued and poorly understood.

"This may in part be due to its nature as a complex, hidden resource that is difficult to conceptualise."

Some of Australia's iconic groundwater resources include the Great Artesian Basin, which covers one fifth of the continent; the alluvial aquifers of the MurrayDarling Basin, which supports Australia's major food bowl; the Perth Basin, which supplies much of the city's water demands; the Canning Basin in northern Western Australia; the Daly Basin of the Northern Territory; and the Otway Basin aquifers of south-east South Australia and southwest Victoria. Of course, there are many smaller resources that are just as important as these, sustaining communities, agriculture and the Australian economy.

Australia's annual water consumption is estimated to be around 15,000 GL, with around one third of this reported to be sourced from groundwater. Many believe that actual groundwater use may be approximately double this. The total 'sustainable yield' of Australian groundwater resources across all salinity classes is estimated to be 29,173 GL, of which 18,310 GL/a is of potable quality. However, methods of estimating 'sustainable yield' are evolving with improved data collection and scientific understanding and this estimate may change in the future.

Large areas of Australia rely almost entirely on groundwater as their water source and groundwater represents at least 50% of the water supply for more than three quarters of the Australian continent. Available data indicates that NSW, WA and Queensland are the highest groundwater users of the Australian states and territories, and WA, the NT and NSW are the most reliant on groundwater as a water source.

Although groundwater is present throughout Australia, much of it is too saline for drinking or agricultural purposes due to the accumulation of naturally occurring salts. This is the case across large areas of WA and limits where groundwater can be used for these purposes.

However, the more saline groundwater resources can be important water sources for mining and industry.

Of the groundwater used across Australia in 1996/97, approximately 70% was used for agricultural and/or pastoral purposes, with the remainder used for domestic and town water supplies, and for industrial purposes, including mining.

"As more and more pressure is placed on groundwater

resources through increased pumping and a changing climate, declines in groundwater levels are causing a growing awareness of groundwater as a critical natural resource," Groundwater in Australia states.

Groundwater is often looked at as an alternative water supply when surface water resources become limited or more tightly regulated. This has caused significant increases in groundwater use in the past, because its use has been less regulated, and was part of the reason for an estimated 60% increase in groundwater use between 1983/84 and 1996/97. Such increases in groundwater extraction from aquifers cause sustainability issues, which often cross state and territory boundaries. Although its use appears to be still within sustainable limits at a national scale, many individual systems have become over-used and/or over-allocated.

To improve water management in a nationally consistent way, a national policy framework, the National Water Initiative (NWI), was developed in 2004. Through this, federal, state and territory governments have committed to a 'whole of water cycle' approach and to returning over-allocated and over-used groundwater systems to environmentally sustainable levels of extraction.

This has been a major step forward in water management in Australia.

Despite this, numerous issues and challenges remain for groundwater management in Australia, including: over allocation and overuse of groundwater; impacts of groundwater extraction on surface-water systems and other groundwater-dependent ecosystems; managing the effects of climate change on the availability and quality of groundwater resources; impacts of mining on groundwater systems; sea water intrusion into otherwise fresh aquifer systems and other mechanisms of salinisation of groundwater resources; optimising the use of managed aquifer recharge; and developing and implementing effective water plans.

Groundwater data has traditionally been widely scattered and difficult to access, and the information contained in Groundwater in Australia was drawn from many varied sources. Bringing it all together into national scale summary maps and graphs was not a trivial exercise, particularly when examining historical trends, because of inconsistencies in how data has historically been recorded and reported across the country. However, initiatives of the NWI and, in particular, the Bureau of Meteorology's suite of groundwater data products, mean that nationally consistent datasets are becoming more available and this sort of information should be more accessible in the future. 7 Research associate Dr Nikki Harrington is the co-author of Groundwater in Australia with Prof Peter Cook, deputy director of the NCCRT at Flinders University.

The full report can be viewed at .

Atherton Cairns Tablelands Great Artesian Basin Pioneer Valley Gladstone Brisbane Perth Basin Murray Darling Perth? Basin o Newcastle Esperance Sydney WALbany Porous, extensive highly productive aquifers Porous, extensive aquifers of low to moderate productivity Fractured or fissured, extensive highly productive aquifers | | Fractured or fissured, extensive aquifers of low to moderate productivity otway Basin ~] Local aquifers, of generally low productivity

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 6,288 CIRCULATION

McDonald says the University of NSW Arid Zone Research station received record ...

 [ABC Broken Hill, Broken Hill, Rural Report 2, Cherie Mcdonald](#)

14 Jan 2015 6:46 AM

Duration: 5 mins 46 secs • ASR AUD 713 • NSW • Australia • Radio & TV • ID: W00060241478



McDonald says the University of NSW Arid Zone Research station received record breaking rain since records began. Ian Ackworth, University of NSW, says that there have been two major bursts of rainfall. He says that they received Federal funding to put in monitoring for groundwater to understand the impacts of climate change.

Interviewees

Ian Ackworth, University of NSW

 N/A ALL
N/A MALE 16+
N/A FEMALE 16+