

Australian Groundwater Modelling Guidelines: past and future

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Abstract: Groundwater modelling guidelines describe best practice for groundwater management models. In Australia, guidelines were developed for the Murray-Darling Basin Commission in 2001 (Middlemis et al., 2001) and for the National Water Commission in 2012 (Barnett et al., 2012). These guidelines have since been supplemented by Explanatory Notes from the Independent Expert Scientific Committee on Unconventional Gas and Large Coal Mining Development (<https://www.iesc.gov.au/information-guidelines>), guidelines developed by the government of New South Wales ([Groundwater guidelines for state significant projects](#)), and materials developed for the Groundwater Management Decision Support Initiative (<https://gmdsi.org/>).

Most of those resources were developed for groundwater modellers and much remains valid. However there remains a gap in accessible guidance for decision-makers who are also not groundwater modellers: water managers and industry proponents who commission models, regulators who must review environmental impact assessments, and others who want to understand and use model results after they have been published.

Since the 2012 guidelines were developed, there has been significant development in computing power and supporting software. In many cases, the questions that models are being used to inform have also become more complex. However, it is often the case that the data available to support the investigations has not noticeably increased in complexity or quantity.

To address these issues, the South Australian Department for Environment and Water has been funded by the Australian Government, through the National Water Grid Fund, to develop updated Australian Groundwater Modelling Guidelines aimed at end-users. The project will produce two documents: a set of guidelines aimed at decision-makers and a report of recommendations for further work.

This project is consulting with stakeholders from all states and territories. As a first step, a survey targeted those who use the existing guidelines, to see what should be retained and what should be revised or added. Fifty-one responses were received. Some responses were brief; others were very detailed. Each response was broken down into separate points and paraphrased, between 1 and 47 points per response, with a total of 471 points raised. These were then categorised by topic and summarised. Topics raised frequently included: simplicity and complexity, project planning, data requirements, conceptualisation, uncertainty analysis, and communication and reporting.

The project is commencing a series of workshops to inform the development of the guidelines, seeking input from groundwater modellers, decision-makers and end-users. Advice is also welcome from those who have developed guidelines for other areas of modelling. The consultation will inform the new guidelines, aiming to raise the standard of groundwater modelling across Australia. (<https://www.environment.sa.gov.au/australian-groundwater-modelling-guidelines-revision>).

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