GOYDER INSTITUTE MODEL METADATA TEMPLATE

METADATA REQUIRED	DETAILS
Model Name and version	South East Regional Groundwater Flow Model SE2015_SS.gwv (Steady-state model version) SE2015_TR.gwv (Transient model version)
Date of lodgement of Metadata Template Name of Metadata Provider	August 2015 Dr Nikki Harrington (nikki@innovativegroundwater.com.au)
Goyder Institute Project Number and Name	**GOYDER INSTITUTE FOR WATER RESEARCH** Project No. E.2.6 South East Regional Water Balance – Phase 2 Task 1 – Regional Water Balance Model
Project Team	Project Leader: Dr Nikki Harrington nikki@innovativegroundwater.com.au Other Task Leaders : Dr Russell Crosbie Russell.crosbie@csiro.au Dr Sébastien Lamontagne Sebastien.lamontagne@csiro.au
Creator/Developer	Dr Leanne Morgan leanne.morgan@flinders.edu.au Prof Adrian Werner adrian.werner@flinders.edu.au Matthew Knowling matthew.knowling@flinders.edu.au
Owner/Contact Person and contact details	Dr Leanne Morgan Leanne.Morgan@flinders.edu.au Or Professor Adrian Werner Adrian.Werner@flinders.edu.au
Model Location	*Where is the model archived?* *Provide contact details of individual and unit/group within designated organisation* The model is archived in the SA Government DEWNR Science Monitoring and Knowledge, Model Warehouse. Contact Dr Graham Green (DEWNR, Graham.Green@sa.gov.au) for access to the model. *Is there a version of the model in active further development? Where is this active version located? No*
IP or other permission requirements	****** REFER TO GOYDER INSTITUTE FOR WATER RESEARCH AGREEMENT** ****Are there any IP issues associated with the model and/or the dependencies that future users need to be aware of?* IP owned by Flinders University as per the Goyder Institute agreement, but licenced to CSIRO and DEWNR.

METADATA REQUIRED	DETAILS
Licences associated with model and/or dependencies	********* **REFER TO GOYDER INSTITUTE FOR WATER RESEARCH AGREEMENT** ******* *Are there any licenses associated with the model and/or the dependencies that future users need to be aware of?* NO
Confidentiality agreements associated with model and/or dependencies	*Are there any confidentiality agreements associated with the model and/or the dependencies that future users need to be aware of?* NO
Brief outline of model	Regional-scale groundwater flow model of the groundwater system that includes the Lower Limestone Coast Prescribed Wells Area (LLC PWA), developed to assess the regional water balance of the LLC PWA and provide boundary conditions for local-scale models.
Area/region covered	Model domain includes the Lower Limestone Coast Prescribed Wells Area (LLC PWA) in the Lower South East of SA, and part of the Border Designated Area, and the encompassing groundwater flow system (Figure 1). This includes the Gambier sub-basin of the Otway Basin and the south-western part of the Murray Basin. Stratigraphically, the model includes both the unconfined Tertiary Limestone Aquifer (and overlying Quaternary Units) and the Tertiary Confined Sand Aquifer.
Platform and language and version	MODFLOW 2000 (Harbaugh et al., 2000). Groundwater Vistas v6.4 pre- and post-processing software (Environmental Simulation Systems, Inc., 2010).
Dependencies upon: i) other models and/or platforms (including version) and location ii) essential data and data sources and location	The various model input datasets are stored with the model as indicated under 'Model Location'. The MODFLOW recharge input file for the current version of the model was developed using the LEACHM unsaturated zone model (Hutson, 2003). The MODFLOW recharge input file is stored with the regional groundwater flow model, as are the LEACHM files used to create it. Details of the LEACHM model are provided in a separate model metadata sheet titled 'LEACHM' available on the Goyder Institute website http://goyderinstitute.org/

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How was model used	The regional groundwater flow model was used to investigate the regional water balance, identify areas of weakness in the conceptual model and provide preliminary estimates of the regional water balance for the LLC PWA. In particular, the model was used as a platform to investigate the various methods for implementing the recharge/discharge boundary and their impacts on the regional water balance. See Goyder Institute Technical Report described below for further details. Overall, the model product consists of a steady-state model (using datasets relating to the time period January 1965-December 1974) and a transient model that runs for the time period January 1970-December 2013. This is the calibration period for the model. The model does not yet include scenarios beyond 2013. The model report for the current version of the model has been externally peer reviewed, with the issues described above being the main ones highlighted by the reviewers. The model can be run for earlier or later time periods than the ones described above, providing that the temporally variable input data (climate, land use, groundwater extraction) is available or can be generated for those time periods. The current version of the model relies on recharge input data derived from the application of the LEACHM unsaturated zone model, so extension of the model time period requires re-running the LEACHM model to generate the additional recharge input data.
Specificity of data	The majority of the input data for the model was obtained from DEWNR datasets or other publically available datasets (climate data and soil maps). All data used in the construction of the model is stored with the model. Contact Dr Graham Green (DEWNR, Graham.Green@sa.gov.au)
Datasets/data products produced	All datasets produced to support the development of the regional groundwater flow model are stored with the model at Flinders and in the DEWNR Model Warehouse as detailed in 'Model Location'
Other Information	

METADATA REQUIRED	DETAILS
Publications (papers and technical reports)	Barnett, S, Lawson, J, Li, C, Morgan, L, Wright, S, Skewes, M, Harrington, N, Woods, J, Werner, A and Plush, B, 2015, *A Hydrostratigraphic Model for the Shallow Aquifer Systems of the Western Otway Basin and South Western Murray Basin.* Goyder Institute for Water Research Technical Report 15/15. Harrington, N and Lamontagne, S (eds.), 2013*, Framework for a Regional Water Balance Model for the South Australian Limestone Coast Region.* Goyder Institute for Water Research Technical Report 13/14. Harrington, N and Li, C, 2015, *Development of a Groundwater Extraction Dataset for the South East of South Australia: 1970-2013.* Goyder Institute for Water Research Technical Report 15/17. Harrington, N, Millington, A, Sodahlan, ME and Phillips, D, 2015, *Development of Preliminary 1969 and 1983 Land Use Maps for the South East of SA*. Goyder Institute for Water Research Technical Report 15/16. Hutson J (2003) LEACHM (Leaching Estimation and Chemistry Model): A process-based model of water and solute movement, transformations, plant uptake and chemical reactions in the unsaturated zone. Version 4. Department of Crop and Soil Sciences, Cornell University, Ithaca, New York. Morgan, L, Harrington, N, Werner, A, Hutson, J, Woods, J and Knowling, M, 2015, *South East Regional Water Balance Project – Phase 2. Development of a Regional Groundwater Flow Model.* Goyder Institute for Water Research Technical Report 15/38. All Goyder Institute Technical Reports are available at: http://goyderinstitute.org/

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Collaborations and acknowledgements	The model was developed by Flinders University as part of a collaborative project with CSIRO and DEWNR. The following people acted on the Technical Working Group for the model project and provided useful feedback on various technical aspects: Okke Batelaan (Flinders University) Dirk Mallants (CSIRO) Glen Walker (formerly CSIRO) Graham Green (DEWNR) Saad Mustafa (DEWNR) Jeff Lawson (DEWNR) Chris Li (DEWNR) Saad Mustafa, Jeff Lawson, Mark Dejong (SECWMB), George Mackenzie and David Williamson (DEWNR) provided information on the conceptual model. Saad Mustafa, Cameron Wood (DEWNR), Luk Peeters (CSIRO), Chris Li, Carl Purczel (DEWNR) and Kittiya Bushaway (DEWNR) reviewed the report.
Keywords	South East Regional model Groundwater flow model Water balance

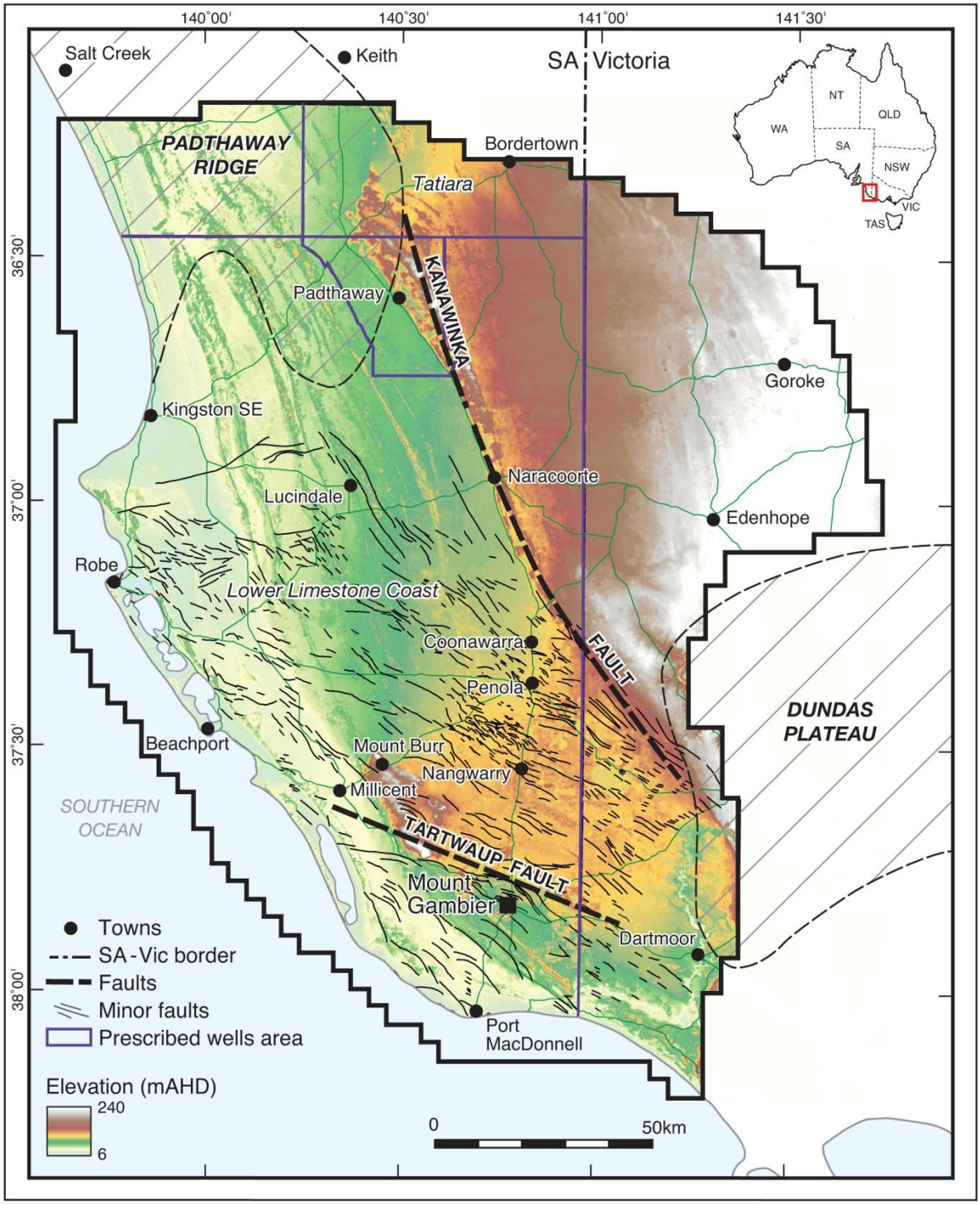

Figure 1. Model domain.