

MARNE RIVER CATCHMENT MODEL 2001

Purpose

As described in Yan and Barnett (2001), a one-layer finite difference groundwater flow model was developed for the Marne River Catchment Plains Zone with the purpose of determining the impacts on groundwater levels of changing stream flow conditions, lateral through flow and expansion of irrigation activities.

Background

The Marne catchment can be divided into two distinct regions with different geology and consequently, different groundwater systems: the Hills Zone and Plains Zone, which are separated by the Palmer Fault scarp.

After flowing out of the hills onto the plains, the Marne River loses water as it recharges the underlying aquifers which are used for stock, domestic and irrigation purposes.

The model was built with Visual MODFLOW version 4.1.

Location

The model was developed for the Plains Zone of the Marne River Catchment, as shown in Figure 1.

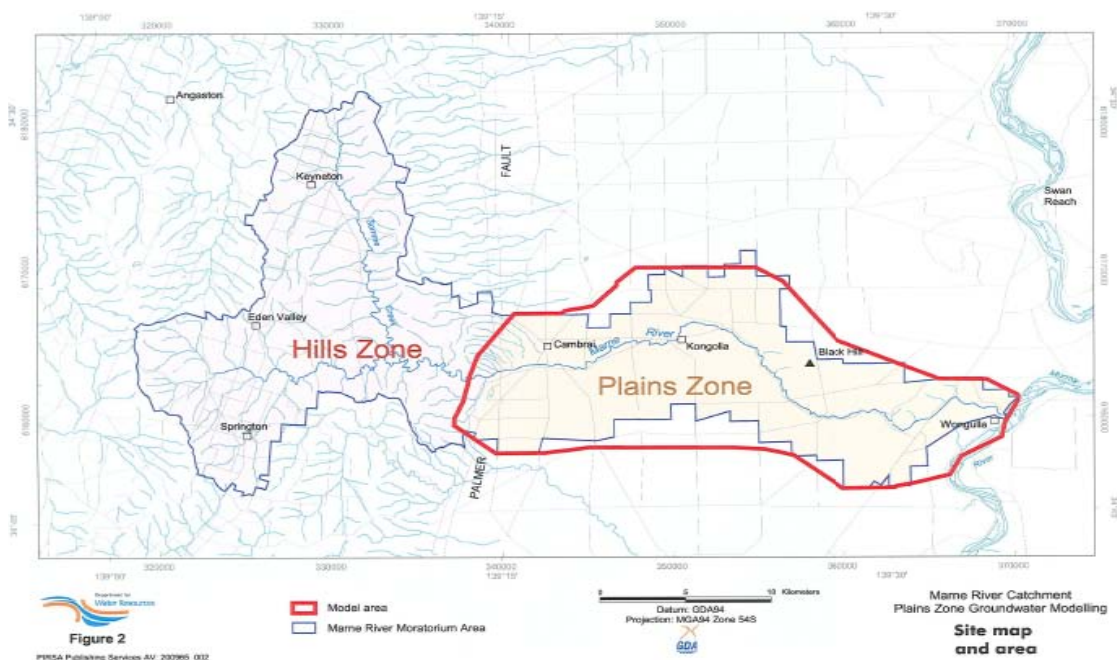


Figure 1. Marne model domain

Model structure

Model domain and grid size

The model domain simulates an area 34 km (east to west) by 16 km (north to south). The bounding coordinates of the model domain are 336580E, 6154043N (south-west) and 370269E, 6170289N (north-east) (GDA 1994, MGA Zone 54).

The rectangular shaped model grid was divided into 100 rows and 200 columns. The grid size is 168.4 m × 162.5 m.

Model layers

The model was constructed as one layer comprising the unconfined/confined Murray Group Limestone aquifer with varying thickness, as shown in Figure 2.

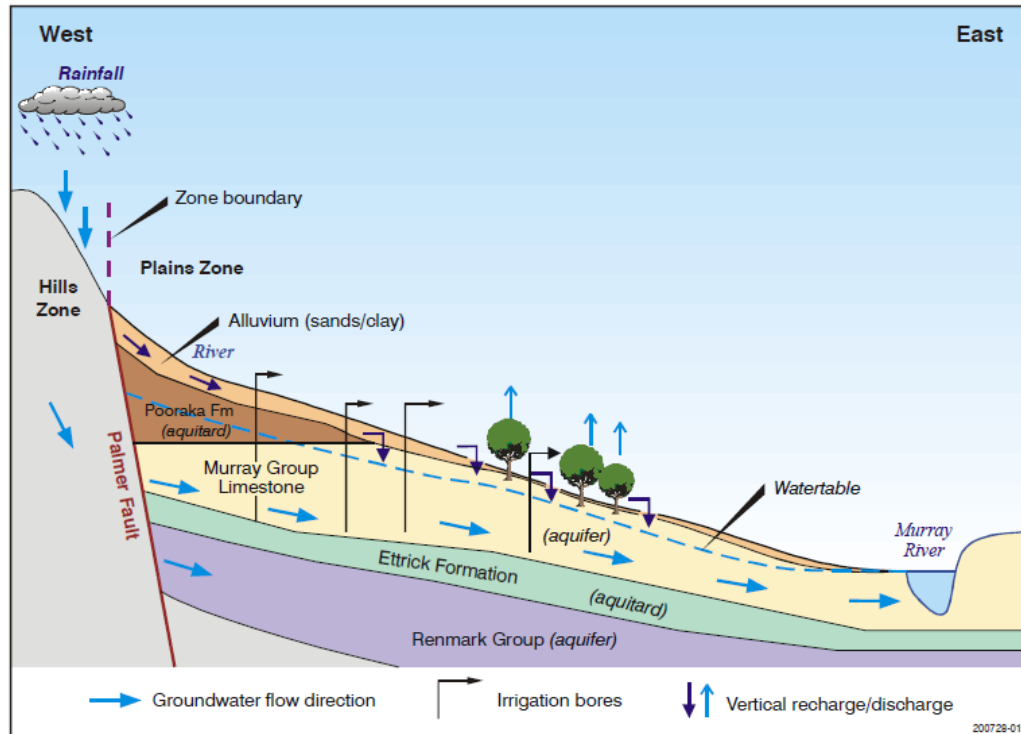


Figure 2. Hydrogeological cross-section and conceptual model

Report

Yan W and Barnett S, 2001, *Marne River Catchment Plains Zone groundwater modelling*, Report DWR 2001/010, Department for Water Resources, Adelaide