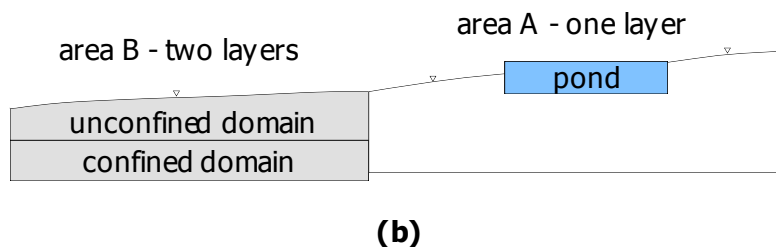
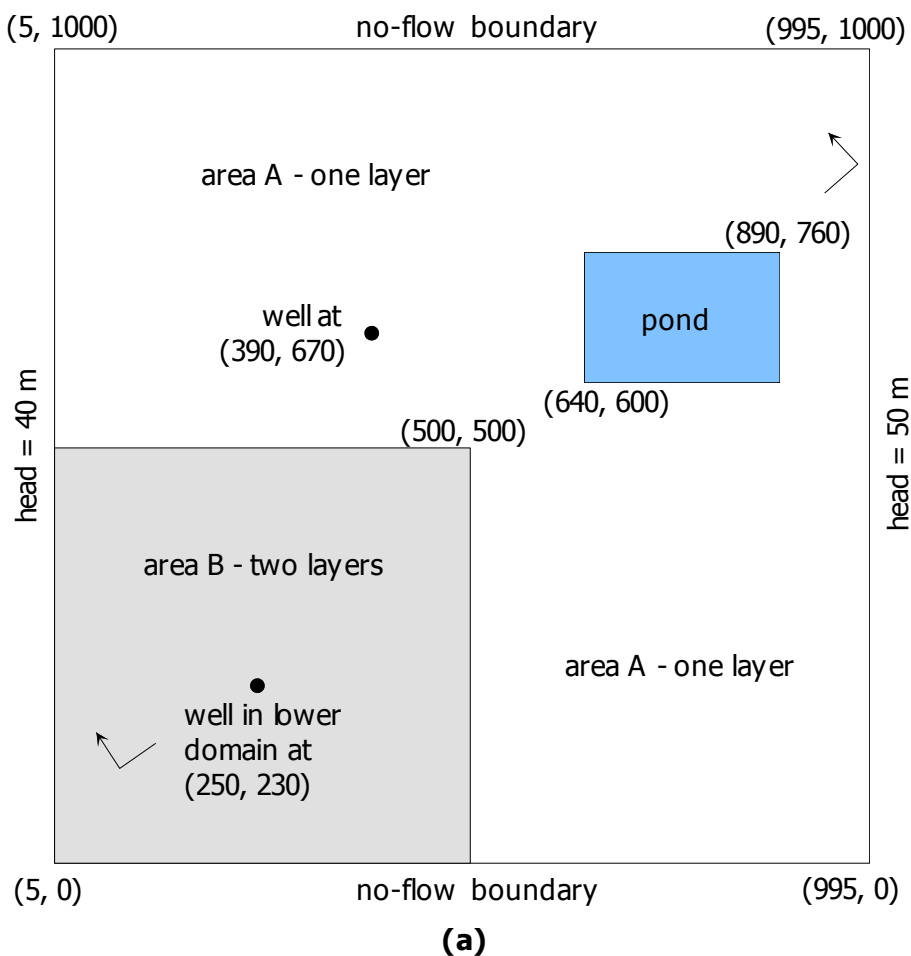


## Description of AnAqSim/MODFLOW model comparison

The plot below shows the plan view layout of the model (a) and a SW-NE cross section through the model (b). The topmost domains in the model are unconfined. In area B, the lower domain is confined and under the pond, the domain is confined. Model properties are listed in the table on the next page. Models were developed with USGS ModelMuse 2.15, MODFLOW 2005 1.9 and AnAqSim release 2012-2.

Steady-state models were run with rates as described in the following table. Transient 100-day runs were made with the steady model as initial condition and one period, 10 time steps, and a time step multiplier of 1.5. For the transient runs, the well discharges were zero and the pond stage increased from 43 to 45 m.



# Properties and rates in the steady and transient models

## Region A domain properties

Hydraulic conductivity $K_x$	0.5 m/day
Hydraulic conductivity $K_y$	2.0 m/day
Base elevation	5.0 m
Specific Yield	0.08
Recharge	0.0010 m/day
Well A discharge, steady state	-200 m <sup>3</sup> /day
Well A discharge, transient period	0 m <sup>3</sup> /day

## Region B upper domain properties

Hydraulic conductivity $K_x$	10.0 m/day
Hydraulic conductivity $K_y$	2.0 m/day
Hydraulic conductivity $K_z$	0.5 m/day
Base elevation	20.0 m
Specific Yield	0.08
Recharge	0.0025 m/day

## Region B lower domain properties

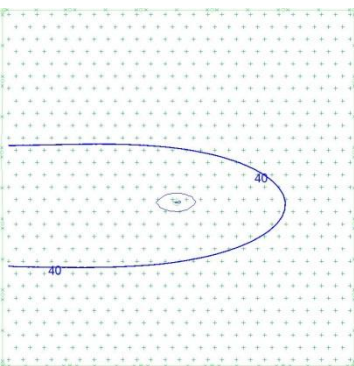
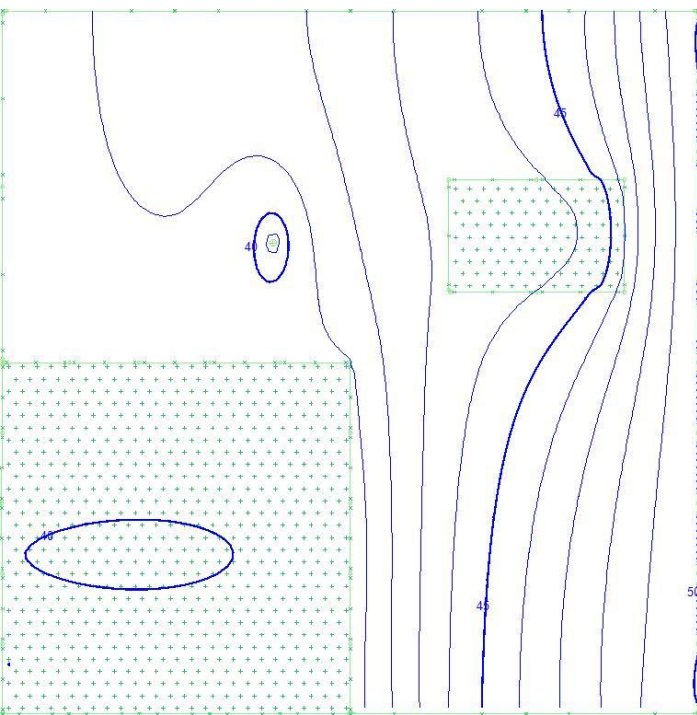
Hydraulic conductivity $K_x$	20.0 m/day
Hydraulic conductivity $K_y$	4.0 m/day
Hydraulic conductivity $K_z$	0.5 m/day
Base elevation	0.0 m
Top elevation	20.0 m
Storativity	0.002
Well B discharge, steady state	-700 m <sup>3</sup> /day
Well B discharge, transient period	0 m <sup>3</sup> /day

## Pond area domain properties

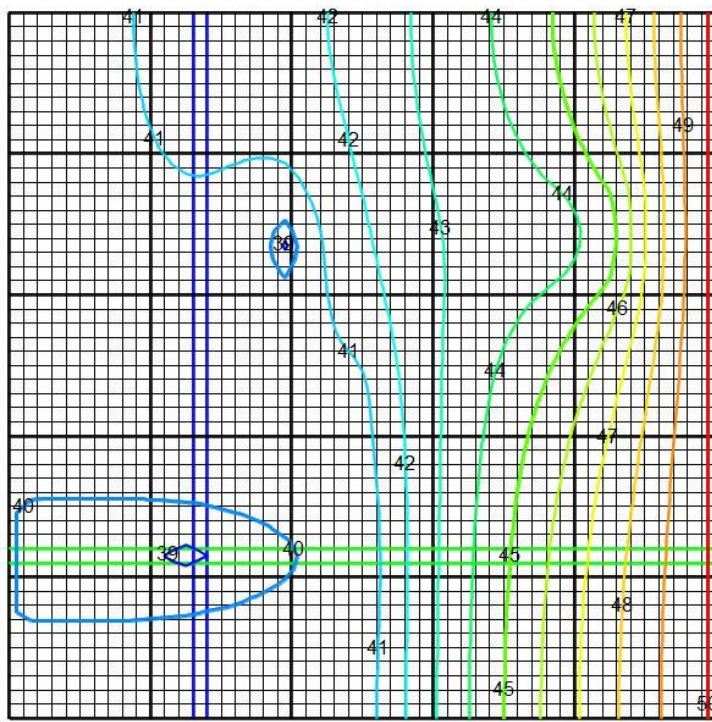
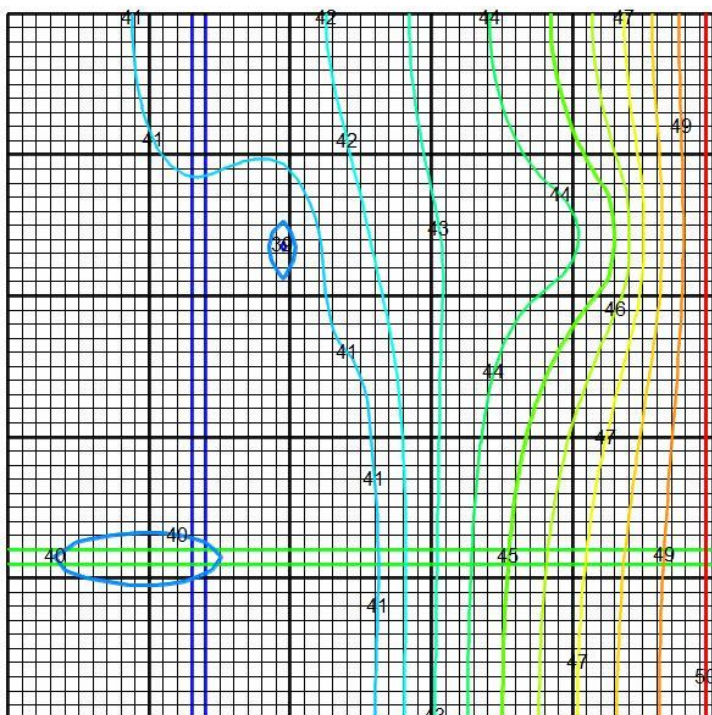
Hydraulic conductivity $K_x$	0.5 m/day
Hydraulic conductivity $K_y$	2.0 m/day
Base elevation	5.0 m
Top elevation	40.0 m
Storativity	0.002
Conductance of pond bed ( $K_z/dz$ )	0.015 day <sup>-1</sup>
Head in pond, steady state	43 m
Head in pond, transient period	45 m

Note: The MODFLOW model had two layers throughout. To be equivalent to the single level of the AnAqSim model in Region A and under the pond, the vertical K in both the upper and lower layers in these areas was set to a very high number, so the two MODFLOW layers behaved as one.

**Comparison of steady state model results. Upper level (top row) and Lower level (bottom row). Head contour interval 1 m.**



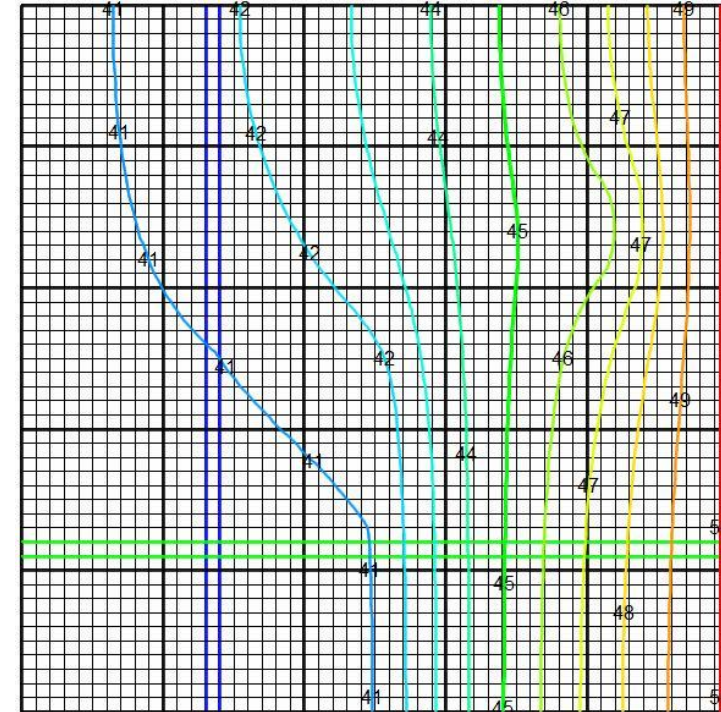
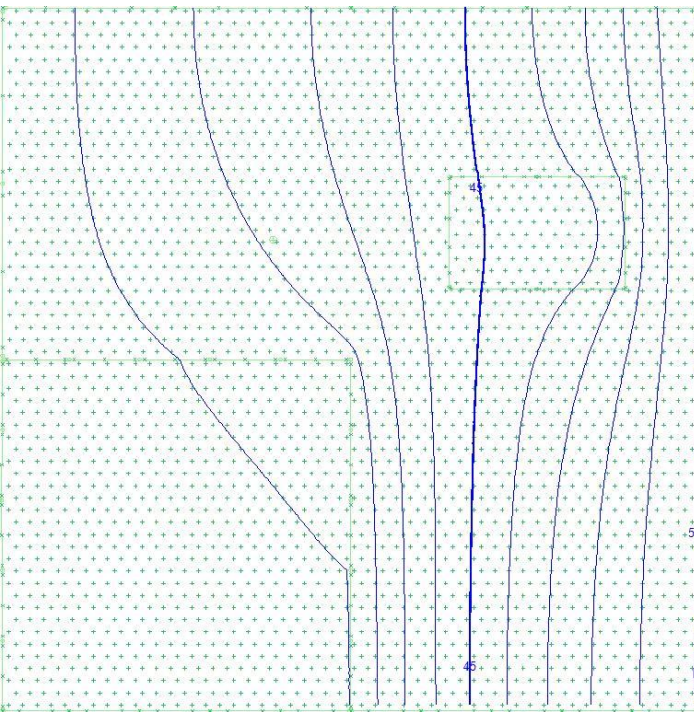
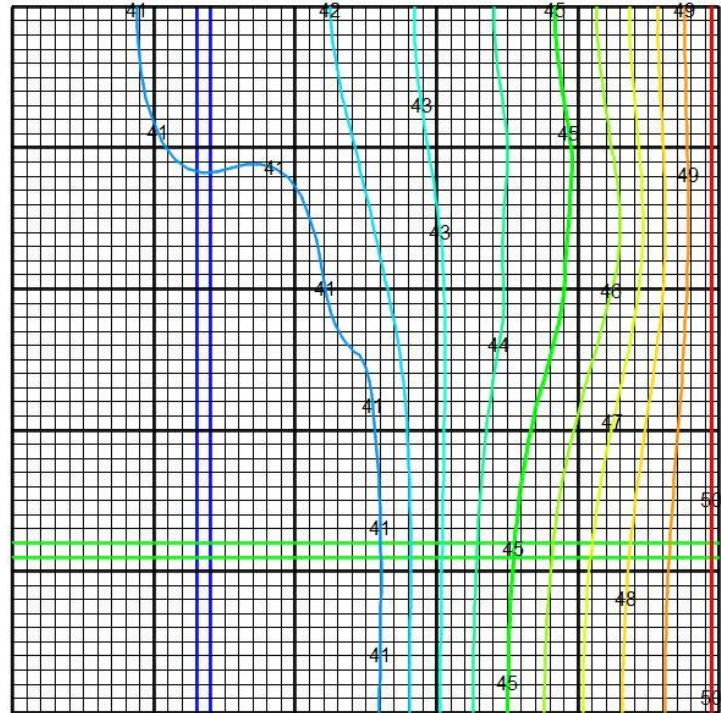
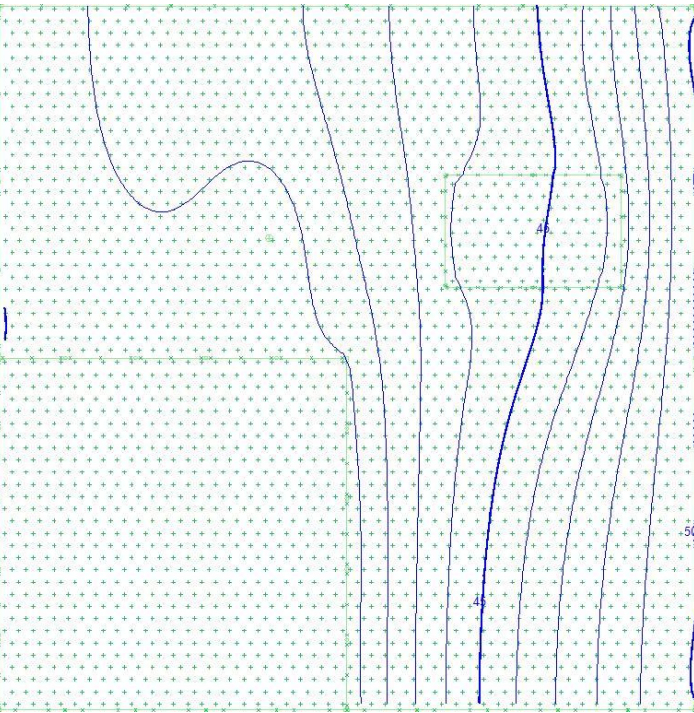
AnAqSim



MODFLOW



**Comparison of transient model results. Upper level at time step 3,  $t = 4.19$  days (top row) and upper level at time step 10,  $t = 100$  days (bottom row). Head contour interval 1 m.**



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MODFLOW