Campaspe Toy MODFLOW Model

This document describes the conceptualisation and components of the toy model. To aid in the development of the integration of the MODFLOW groundwater model of the Lower Campaspe valley, a toy model with all the components of the full-scale model was developed that contains a version of the packages that will be used (only one realisation).

MODFLOW version: [**MODFLOW-NWT**](http://water.usgs.gov/ogw/modflow-nwt/)



Streams & channels, [**RIV**](http://water.usgs.gov/ogw/modflow-owhm/Guide/index.html?riv.htm)

Unconfined and confined aquifers, [**UPW**](http://water.usgs.gov/ogw/modflow-owhm/Guide/index.html?nwt_newton_solver.htm)

Wells, [**WEL**](http://water.usgs.gov/ogw/modflow-owhm/Guide/index.html?wel.htm)

Effective Rainfall & Irrigation, [**RCH**](http://water.usgs.gov/ogw/modflow-owhm/Guide/index.html?rch.htm)

Evapotranspiration, [**EVT**](http://water.usgs.gov/ogw/modflow-owhm/Guide/index.html?evt.htm)

Figure . Model schematic (not to scale) for the Campaspe toy model highlighting MODFLOW version, and packages used in the model.

* The groundwater model is implemented using [*flopy*](http://modflowpy.github.io/flopydoc/index.html) which is a model builder and model output reader scripted in Python. The toy model follows the examples provided on *flopy*’s website.
* The main communication from the higher level integrated model to the groundwater model will be variable recharge input, well pumping and river levels based on the farm decisions of the integrated model.
* The main communication from the groundwater model to the integrated model will be the following outputs:
* River-aquifer exchanges (summed by reach)
* Groundwater levels at select locations
* The main interface between these two (or some emulation of the groundwater model) will be some script that calculates spatial recharge to the model based on farms decisions for pumping groundwater and irrigation. It will also need to include river levels and take account for rainfall and evapotranspiration. This spatial map can then be mapped onto the model grid and input to the groundwater model.

Other notes:

* The RIV package is currently selected for representing rivers but other packages such as [SWR](http://water.usgs.gov/ogw/modflow-owhm/Guide/index.html?swr.htm) and [SFR](http://water.usgs.gov/ogw/modflow-owhm/Guide/index.html?sfr.htm) will be considered.