

Interactive comment on “Modelling overbank flood recharge at a continental scale” by R. Doble et al.

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In “Modelling overbank flood recharge at a continental scale” the authors develop an approach to understanding and quantifying flood driven recharge on the Australian continent. Overbank flood recharge can represent a significant source of recharge and understanding how to represent it in models is an important scientific insight. The manuscript as currently written represents a technical contribution of how this process could be represented in a regional to continental scale model.

The method developed is fairly simple depending largely on a Darcy’s law representation of the underlying processes and the integration of a variety of temporal and spatial data sets. Among these data sets are a DEM, a soils map and MODIS remote sensing data.

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The current paper is a good step in developing this underlying methodology that is needed to better represent flood recharge processes at the continental scale. The authors outline challenges with remote sensing data, observational records for the purpose of comparison, and methods of filtering out outliers in borehole data. In the current structure of the discussion the authors' recommendations get lost in the headings and presentation of the discussion section as a whole. My own observation is inverting the discussion section and starting with the discussion of "how important is the overbank flood process?" would be a better place to start to the discussion. In this way the authors would first emphasize the importance of their results possibly by also pulling in more references from the groundwater/surface water interaction literature on the importance of flood flows to groundwater recharge. Thus once having demonstrated the importance of the process the authors can then lead the readers through the MODIS and spatial data set caveats and then proceed to the problems with observational records. The authors may have a better way of changing the discussion than the one I just suggested the key from the perspective of this reviewer is that right now the need for improved input and groundwater observational data sets gets lost in the discussion of the model results. That problem is the nub of my comment here.

One additional observational record the author does not dwell on is the use of gravity measurements both on site and through GRACE to assess their model results. While the resolution of GRACE is probably too coarse for the specific study here it could provide some grounding for the approach used by the authors.

Minor comments Page 12582- The authors go to some length in describing the Healy and Cook 2002 and Crosbie et al. 2005 methods of estimating groundwater recharge from borehole data much of this discussion is unnecessary as the authors ultimately just use before and after head observations and use the difference as an estimate of recharge.

Page 12584 First sentence of results is not needed.

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Page 12585 line 1 - First sentence is not needed. Second, sentence should end with (Figure 2).

Page 12585 line 11 - First sentence not needed second sentence should end with (Figure 3).

Page 12586 line 5 - First sentence not needed second sentence should end with (Figure 4).

Page 12586 line 9-10 Sentence here not needed following sentence should end with (Figure 5).

Page 12587 Lines 16-19 First two sentences not needed third sentence should end with (Table 3 and Figure 8)

Page 12587 line 23 This should be followed by the word value

Page 12588 Line 9 First sentence not needed second sentence should end with (Figure 9).

Page 12588 line 10 Loddon should be added before the word catchment

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