

Interactive comment on “A high resolution global scale groundwater model” by I. E. M. de Graaf et al.

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Based on an initial reading, this manuscript seems thorough and represents an important contribution to the literature. I glossed over some areas beyond my expertise (e.g., the river parameterization). Below are some minor comments / suggestions:

The methods should explain briefly (in addition to the references) how the surface fluxes / vegetation / atmospheric boundary conditions in the PCR-GLOBWB are determined. Is this a full land-surface model like that found in a global climate model?

Eq. 3-5 are a bit hard to follow and may need some additional explanation.

Eq. 6 seems to be mixing the concept of near-surface permeability with the deep-

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groundwater permeability as determined by Gleeson et al 2011. Is it realistic to decay to zero below the depth α , or should there be a minimum bedrock permeability for the thickness of the aquifer? Give some idea of the range of α . Is α the soil depth, the regolith depth, or the depth to impermeable bedrock?

In the determination of the 6' gridcell properties, I'm not sure if it is done at 30" and aggregated up, or if the 30" data is only used to calculate the floodplain depth for the 6' cell and the average depth is used in determining that 6' cell's properties.

What is the difference between the "true" and "apparent" MODFLOW gridcell area?

The Figure 6 caption needs correction.

Figure 8 caption: where are the white areas referred to?

Good luck on a productive review and publication.

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