

Hydrol. Earth Syst. Sci. Discuss., referee comment RC2  
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## Comment on hess-2022-330

Anonymous Referee #2

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Referee comment on "Impact of urban geology on model simulations of shallow groundwater levels and flow paths" by Ane LaBianca et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-330-RC2>, 2022

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This paper examines the impact of representation of anthropogenic urban geology and spatial resolution on the simulation of shallow groundwater levels and flows. The authors developed two geological models from an existing hydrostratigraphical model by accounting for urban subsurface infrastructure and soil material and integrated them with hydrological models of 50m and 10m resolution. The effect of geologic configuration and spatial resolution are then analyzed in terms of high-water levels and particle tracking using a case study of the city of Odense in Denmark. Overall, I find the paper well written and comprehensive. It is worthy of publication.

The methods and results are well-explained, and I have no comments on them. Since this paper is submitted as part of a special issue ('Representation of water infrastructures in large-scale hydrological and Earth system models'), I would suggest that the authors revise the introduction, discussion, and/or conclusions to bring out the broader implications of advancing representations of human-water interactions in hydrological/geological models due to increased impacts of anthropogenic interventions.

Other comments I have are minor issues to be corrected:

Line 260: Missing reference

Line 301-302: Consider revising to "and another set of parameters selected to be tied to..."

Line 302: "and" instead of "sand"

Line 315: "Eq" instead of "Ep"

Line 317: "Eq. 2" instead of "Eq. 3.2"

Eq. 2 and Line 325: Why do the weights have subscript  $h_i$ ,  $d_j$ , and  $h_k$ ? Do they change according to indices  $i$ ,  $j$ ,  $k$ ? Perhaps it will be clearer to specify the weights in Line 325 (e.g. state " $w_{h_i} = 0.45$ ")

Fig. 4: Refrain from using a rainbow colour scale as it could misrepresent data due to its non-linear change in hue

Fig 5: "56%" instead of "57%" in the bar plot

Line 438 – Line 441: Please check the subscripts of the model parameters. Some capitalisations are inconsistent with those in Fig. 10

Line 446-447: delete "4.3 Simulation of high-water levels."

Line 452: "V2\_50" instead of "V2\_5"

Line 477: add "models" after "V2"

Line 509, 517: Check capitalization and subscript of parameter " $D_{r,grass}$ " and " $K_{Qs2,h}$ "