

Geosci. Model Dev. Discuss., referee comment RC2  
<https://doi.org/10.5194/gmd-2022-161-RC2>, 2022  
© Author(s) 2022. This work is distributed under  
the Creative Commons Attribution 4.0 License.

## **Comment on gmd-2022-161**

Anonymous Referee #2

---

Referee comment on "Coupling a large-scale hydrological model (CWatM v1.1) with a high-resolution groundwater flow model (MODFLOW 6) to assess the impact of irrigation at regional scale" by Luca Guillaumot et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2022-161-RC2>, 2022

---

This paper presents a relevant model contributions to large-scale hydrological and groundwater modeling. The paper combines CWatm and MODFLOW, and focuses on including irrigation and pumping, and the this at two very different basins (Austria and India). After addressing the following (minor) revisions, the paper seems publishable.

- The first sentence of the short summary is ambiguous. I'd suggest something along the lines of "We develop and test the first large-scale hydrological model at regional scale with a very high spatial resolution that includes a water management and groundwater flow model"
  
- It would help if the short summary had a statement about what these results tell us about this model development. E.g. what can it do, that we could not before.

- L30: (river incision) is a confusing statement here.
  
- L41: “[...] the last point is of interest for locally relevant applications, but it could be replaced by “representing small-scale processes driven by topography”.” This is a very confusing statement that does not seem to reflect the complexity small scale processes in hydrology.
  
- Section 4.2. Cm of water table depth is a bit an awkward metric as this puts (potentially) a lot more weight on very shallow water table depths (it can go to near infinitely large contributions).
- Line 463-465: these units do not seem to make sense.
- Specify somewhere what KGE is.
- Figure 4-5: the multiplication factor of the panel (a) y-axis is not readable).
- Is the appendix necessary or could it just be SI?