

Interactive comment on “Integrated assessment of future potential global change scenarios and their hydrological impacts in coastal aquifers. A new tool to analyse management alternatives under uncertainty in the Plana Oropesa-Torreblanca aquifer” by David Pulido-Velazquez et al.

Anonymous Referee #2

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Unfortunately, the manuscript is not ready for publication yet. Below, a number of critical issues are raised, including methods, discussion and results.

Organization: - Chapter 2.3, 2.4 and 2.5 should be moved to Methods

Methods: - The applied modeling system is described as “integrated”. However, there are no feed-backs in the system so it is misleading to call it integrated. A term like “coupled” would be more appropriate. - It is not clear how the rainfall-recharge model

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was calibrated – which data and which period. Results on calibration missing. - It is not clear how spatial heterogeneity (it must be significant in this area) is handled. - Which area do the groundwater model cover? - Do the groundwater model describe both the Plioquaternary and the prequaternary formations? - Do the model take into account that the formations are fractured? - 11 model layers are used – is that sufficient to avoid too much numerical dispersion? - It is stated that inverse modeling is not used “due to the complexity of the case study dealt with”. Does that imply that auto-calibration cannot be used for complex systems? If that is what you mean, please argue why. - As a minimum the match to the observations should be quantified by a few statistics (e.g., Mean Error, Root Mean Squared value) - Future climate signals are found by averaging the results from the available climate models and subsequently feed this averaged signal into the hydrological models. Alternatively, results from each individual climate model should have been used as input to the hydrological model system and averaged afterwards. Please document that the method used is appropriate. - Details on the downscaling methods completely missing. There are many versions of what you call “bias correction” – which one did you use? - How was the delta change method applied – monthly, yearly? Results: - The result section is very short and does actually not explain why the presented results are obtained. For example, why is the impact of sea level rise to insignificant? - What is most important – climate change or LULC changes?

Discussion: - There is no discussion of the results and this is critical. The manuscript cannot be published without a proper discussion of the results. This includes a comparison of methods and with results from other studies.

Uncertainty: - The uncertainty of the results are not touched at all. Considering the chain of model component that are used the total uncertainty of the obtained results must be significant. A discussion of this element is mandatory. Quantification would be even better.

