Monitoring and modeling infiltration-recharge dynamics of managed aquifer recharge with desalinated seawater
by Ganot Y. et al.

Comments to authors:
Based on the solid monitoring and modeling work, the authors are trying to explain the relationship between surface infiltration and groundwater recharge during MAR with desalinated seawater in one pond located in the coastal Israel. Currently, there is few researches done on MAR with DSW in the coastal areas of the world. They obtained a good dataset. However, the authors did not give good illustration on these data. More consideration as to how this study can inform others elsewhere in the world. I hope that the comments are useful to the authors in revising this study.

Specific comments:

Page 4 Line 8: “is” should be ‘are”.

2.4 section:
Page 4: How to calculate infiltration rates for different conditions should be introduced here.
For pond scale, the pond infiltration rates were calculated by linear-regression of ponding-depth declines due to breaks in inlet discharge during MAR event.
For single-ring scale, the single-ring infiltration rates were calculated by linear-regression of pressure-head vs. time data. Why did you define that “Infiltration tests with relative errors higher than 15% were omitted from the analysis.”?
For vadose zone: Infiltration rates were estimated from the velocity of the fronts multiplied by the change in volumetric water content data.
For the three aspects mentioned above, could you give the corresponding references or clear conceptual sketch map to illustrate this parameter? This will help readers better understand the infiltration rates under different conditions.

Page 4, Lines 29-31. As the numerical model used both the water table and ponding-depth data, what is purpose of the two analytical model under simplified condition?

Page 5, Lines 14. The impacts of the assumption of the unit gradient flow for steady state should be evaluated under the transient condition as the water table rise significantly during the recharge period.

Page 6, Line 32-33. It is not very clear to me how the variable head boundary was applied at the bottom boundary of the Hydrus-1D model and how simulate the transient behavior of the water table. Did you specify variable head at a fixed location and output the flux at this boundary? Please clarify this.

Page 10, Lines 12-14. Another reason why the numerical model seems more reliable

than the simplified model may be that the numerical model was calibrated based on observations. I think some testing work of the assumptions (i.e., saturated condition under the pond in the) using the flux distribution from the HYDRUS may be useful for the comparison of the simplified model and numerical model.

Page 11: 4.2 Clogging
Line 21-24: Do you have the hydrochemical data to provide evidence for the dissolution of carbonate and gypsiferous matrix?

Page 12 Line 15-25: this part should be shifted to Methods section.

This manuscript estimated groundwater recharge using one dimensional (1D) analytical models and 1D numerical models. The reasons of using 1D models presented in the manuscript is not justified. It is better to present the results using 2D or 3D models, and compare the results 1D models.

As was indicated by Zhang et al (2016) that using soil pedotransfer functions directly may lead to biased estimation of dynamic soil moisture content, it is necessary to use site specific pedotransfer functions or inverse models to improve the soil hydraulic parameters used in both analytical models and numerical models. Assouline and Or (2013) also wrote that "The empirical-correlative approach at the basis of the PTF offers reasonable initial estimates for certain large-scale analyses (Romano, 2004). However, the limited physical basis for the estimates of WRC and applicability within the range of values used for the regression analysis, necessitate extra caution for their general application". The authors may use other pedotransfer functions to compare the results by using Rosetta presented in the manuscript.

Zhang, Y., Schaap, M.G., Guadagnini, A., Neuman, S.P., 2016. Inverse modeling of unsaturated flow using clusters of soil texture and pedotransfer functions. Water Resour. Res. 52, 1–14
Assouline, S., and D. Or (2013), Conceptual and parametric representation of soil hydraulic properties: A review, Vadose Zone J.,12, 1-20, doi:10.2136/vzj2013.07.0121.
Romano, N. 2004. Spatial structure of PTF estimates. In: Y.A. Pachepsky and W.J. Rawls, editors, Development of pedotransfer functions in soil hydrology. Elsevier Science, New York. p. 295-319.

In the Conclusions section explain in more detail how your project helps us to understand processes in these environments more broadly; the paper will have more impact if researchers from elsewhere in the world can see relevance to their studies and a paper in a major international journal such as HESS needs to have broad appeal.