

Interactive comment on “Estimates of global dew collection potential” by H. Vuollekoski et al.

Anonymous Referee #2

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The article presents an approach to assess the global potential for collecting water from dew on an artificial surface. The approach is based on the use of a model for dew formation (Nikolayev et al., 1996), which is forced with the ECMWF’s ERA-Interim reanalysis archive data for 34 years (1979–2012). The authors found that the yearly yield of dew can exceed 100 l/m² within some water-stressed areas (e.g. northern Africa and the Arabian Peninsula).

Principle Comments Overall, this is an exploratory study which is, to my knowledge, one of very few attempts to estimate potential for collecting over a global scale. The manuscript is well writing, the scientific methods and assumptions are clearly outlined. However, credibility of the main results presented in the current version of the manuscript and based on the used modeling approach is questionable for me.

1. The authors do not discuss performance of the used model and its applicability to the

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considered problem. The only phrase gives a reader some information on these issues: “. . .we followed the approach presented by Pedro and Gillespie (1982) and Nikolayev et al. (1996), which has been found to agree well with empirical measurements of dew collection (e.g. Beysens et al., 2005)” (page 2; lines 110-113). However, in my opinion, the mentioned paper (Beysens et al., 2005) does not support this conclusion. In fact, the results of the model verification are not presented in (Beysens et al., 2005), except for one picture comparing simulated mass of the condensed water with the mass measured in 1 experimental site during 8 hours. This result does not give any basis for use of the model without any additional verification, especially for its use for the global and multi-year scales. I suggest the authors to present more references which could demonstrate for a reader that the model is applicable for different physiographic/climatic conditions, seasons, etc. Note that the authors of the model (Nikolayev et al., 1996) did not use any empirical measurements at all for the model verification.

2. Any model has some parameters, which can not be assigned a priori and have to be adjusted though calibration against the available measurements. Without calibration, as well as without any comparison with experiment data, simulation results look rather arbitrary. I suggest the authors to give complete list of the model parameter values and refer to publications from where the values are taken. Also, it would be useful to add small discussion on the parameters variability in space and time.

3. There are many sources of uncertainty of the obtained assessments of the global potential for collecting water from dew. Among the most important, the uncertainties of the model structure, parameters and meteorological inputs can be mentioned. I have no doubt that these uncertainties affect the obtained assessments and their credibility in a large degree. I suggest the authors to take this issue into account in the discussion section and to moderate some conclusions. In particular, I do not see any basis for the conclusion that “the long (simulated) time-series in our study provides information about the seasonal variation of dew formation as well as long-term trends in dew yield, which may be associated with climate change”

The aforementioned remarks are, in my opinion, a matter of principle and relate to the basis of the approach presented in the paper. I can not recommend the current version of the article for publication.

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