

Interactive comment on “Extending global irrigation maps – going beyond statistics” by Jonas Meier et al.

Anonymous Referee #2

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This paper is well-written and understandable for a greater audience. It provides a clear description of the study and outcomes. The authors display relevant knowledge of global data sets for irrigation mapping, using references. The method to combine statistical data and remote sensing data is interesting. The methodology section and the validation sections may require some additional clarification. The following points can be further elaborated or explained.

The different data sets used in this study, cover different time periods (Table 1). For instance the GMIA has a time frame of 2000-2008, and Globcover covers 2004-2006. However, the study provides an irrigation map of 1999-2012. It is unclear how the different data sets from different periods are agglomerated and if any discrepancies can be caused by comparing different years of data. For instance, if a pixel is fallow during

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the period of Globcover, it will be excluded from the analysis because it was not considered cropland. The GMIA is downscaled using a data set of a different time frame (2004-2006). This might cause some inaccuracies. In addition, it is unclear what the effect is of averaging the NDVI values over 14 years. Several different cropping patterns might exist. Some further explanation will be useful for the reader to understand this part of the methodology.

The methodology and processing diagram (figure 3) shows that the results are highly sensitive to the accuracy of the land cover map (Globcover or ESA-CCI-LC) and the suitability maps. The author can acknowledge this influence and determine the uncertainty of these data sets. Possibly this can be done by validating these 'intermediate' data sets.

The validation paragraph includes a description of the methodology, which is better placed in the methodology section. The validation process can be elaborated by including additional data sets, besides Europe. Also results can be compared with existing regional irrigated areas maps.

Some minor comments in addition to the points mentioned above are: - The use of the term water use efficiency on p.1 l.34 is confusing because it is interpreted differently by different disciplines. In the referenced paper the term irrigation efficiency is used, which is my suggestion as well. - The captions of figure 5 and figure 8 can be improved to give a better description of the figure (without needing to read the text). - The role of supplemental irrigation, meaning the role of irrigation only during the summer (dry) period, is excluded in this study. Supplemental irrigation is relevant especially for regions having sufficient rainfall during the spring and fall. This might be an explanation for a few of the results.

Overall, the paper provides good information and an interesting approach. If these parts of the methodology are elaborated it will be more understandable and transparent for the reader. Also being critical of the 'intermediate' products (land suitability and

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Land cover maps) will improve the paper and give suggestions for future work.

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