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Discussions

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Interactive comment on "Sensitivity of Hydrologic and Geologic Parameters on Recharge Processes in a Highly-Heterogeneous, Semi-Confined Aquifer System" *by* Stephen R. Maples et al.

Anonymous Referee #2

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General comments

The manuscript "Sensitivity of Hydrologic and Geologic Parameters on Recharge Processes in a Highly-Heterogeneous, Semi-Confined Aquifer System" describes an interesting study on local and global sensitivity analysis in the framework of Managed Aquifer recharge, using a realistic case study. Overall, the manuscript is well written and the results are illustrated in a clear manner. Although the research work heavily relies for the creation of the geological model and the setting up of a flow model and MAR on two previous works, the additional research performed in this study and the new findings justify a new publication. I only have a couple of minor suggestions and

some technical details.

Specific comments

Control volume and connectivity metric (lines 179-188; 331-333) Please double check the definition of the control volume and the need for a 6-points connectivity metric: if the control volume is defined as "encompassing vertically-coincident cells" (line 179), then there is probably no need to require a 6-points connectivity metric. For example, with a 6-points connectivity, you can have 2 very horizontally extended layers of a conductive material, separated by a rather impermeable aquitard; if only one cell of the aquitard is conductive, then the 6-points connectivity guarantees connection. Maybe I missed the definition of the control volume. Is it defined by only one cell in the horizontal directions?

Linearity (197-200) As your aquifer is not confined, maybe the fact of separating the contribution of each recharge/no-recharge scenario would not work properly as in the case of a linear problem. Please comment on this.

r **sign** In general, for a negative correlation a negative r is used (line 315, but also the corresponding figures).

Figures

Fig.1 and Fig.3 Please report the original publication source of the figure.

Fig.8 Do you also have a map of IVF? It would be nice to see it on the side of the R_{30d} (see also line 370).

Technical corrections

line 63 1640 m^2

Parenthesis Double check journal guidelines for parentheses (i.e. lines 67, 76-77, 87, 91)

Units repetition It would be more correct to report units close to each number, for example $1 \times 2 \times 3$ m should be something like $1\,\text{m} \times 2\,\text{m} \times 3\,\text{m}$ (see lines 99, 101). This is also valid when a list of numbers (with unit) is reported. See for example line 308, 309, 320.

Subscript fonts In general, subscripts that are not index should not be in italic font (i.e., S_s should be S_s instead) (see line 110 and other locations in the text)

lines 123-124 Check "0 m amsl".

UZ (line 141) Please introduce this acronym.

line 165-166 S_s or S_S?

$V_\text{fines,90d}$ Double check the consistency of this symbol within the documents (see for example Fig.5).

line 479 "to *be* fully..."?

line 538 "to incorporate a measure"