

# ***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**

Received and published: 25 October 2019

## **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<sup>2</sup>

**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 × 2 × 3 m should be something like 1 m × 2 m × 3 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”

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