

Interactive comment on “Tracing the spatial propagation of river inlet water into an agricultural polder area using anthropogenic gadolinium” by J. Rozemeijer et al.

Anonymous Referee #1

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General comments

This is an interesting study dealing with the propagation of river inlet water into a polder area. Gadolinium, a rare earth element, is used as a tracer. Gadolinium distribution in the polder is investigated at two dates with contrasting hydrological conditions to assess the respective proportion of river water in the polder. The method is novel and of great interest. The article is very well written and structured. Research questions are well defined. The conclusions are justified by the presented data. One major point needs revision, though: The authors give percentages of inlet water derived from hydrological modeling, without adequately describing the applied modeling approach.

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I suggest accepting the manuscript with minor revisions.

Specific comments

P. 1412, line 11: Please add one sentence concerning conclusions.

P. 1412, line 19: Siebert et al. (2007) show a map of irrigated areas, but I could not find the information presented in this sentence.

P. 1413, lines 1-16: I suggest shortening this paragraph, as the results presented in this study cannot be transferred to arid/semi-arid areas.

P. 1413, lines 17-26: Move to P. 1412, after line 25.

P. 1414, lines 9-11: This sentence does not really fit into the general introduction, since it explains your approach.

P. 1416, line 14-15: There are three inlets in the south, write instead e.g. ‘the two western inlets’.

P. 1417, line 11-13: Remove, as it is not related to the study presented in this article.

P. 1417, line 19-20: Only mention the parameters presented in this study.

P. 1417, lines 21-26: Please describe the applied modeling approach in detail. I suggest creating a new chapter.

P. 1418, line 25: Do you mean reproducibility limit?

P. 1419, line 7: How was evapotranspiration determined?

p. 1420, lines 2-4: Why was the pre-concentration procedure not applied?

P. 1422, line 7: Was the difference in N_{tot} concentrations significant? At which level?

P. 1422, lines 4-14: I miss a profound evaluation of the measured values (in the discussion). You restrict yourself to a simple comparison of the values at both locations. Please evaluate the magnitudes and give explanations for differences. Which implica-

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tions does the change in water quality entail?

P. 1422, chapter 3.3: In order to present these results, a detailed description of the methodology is required.

P. 1423, lines 5-24: This is a summary and should not be part of 'Discussion and conclusions'.

P. 1424, lines 7-10: Rather fits into the introduction.

Fig. 1, Fig. 2: Merge both figures to one figure.

Fig. 4: Should NO₃ be NO₃-N? If not: Why are the values so low? Explanation of a boxplot is not necessary in a scientific publication.

Technical corrections

P. 1418, line 2: Abbreviation has already been explained (p. 1415, l. 15).

P. 1419, line 5: delete 'for' after anticipated

P. 1419, line 9: replace 'on the other hand' with e.g. 'in contrast'

P. 1421, line 25: insert 'water' after 'river'

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 1411, 2012.