

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

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Thanks for your review and the compliments! About your major suggestion: We agree that the modeling was not accurately described in the paper. The focus of the paper was on the tracer method and, therefore, we preferred to keep the model description very short and to rely on the references to online available reports. In the revised manuscript, we will add supplementary information on the modeling methods. We added a reference to this supplement in the main text of the revised paper.

P. 1412, line 11: We didn't really understand this comment, line 9-14 already are con-

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clusions. Maybe you can indicate what conclusion you would add?

P. 1412, line 19: The map of Siebert et al (2007) shows the areas that are equipped with irrigation systems. Indeed, it doesn't give the source of the irrigation (river water or groundwater). We will remove this reference here.

P. 1413, lines 1-16: We deleted this paragraph

P. 1413, lines 17-26: Done as suggested

P. 1414, lines 9-11: This sentence was removed because of the shortening of the introduction as suggested by another reviewer.

P. 1416, line 14-15: Done as suggested

P. 1417, line 11-13: This sentence introduces the monitoring and modeling that is further explained in the two following paragraphs (and which is used in the paper to illustrate the relevance of insight in inlet water contributions). We changed it into: “Nutrient sources and pathways in the pilot catchments were studied by combining detailed water quality monitoring with process-based models of catchment-scale nutrient transport.”

P. 1417, line 19-20: Done as suggested

P. 1417, lines 21-26: See our response to your major suggestion above

P. 1418, line 25: Yes, changed accordingly

P. 1419, line 7: We added to the methods section: “Precipitation data for this research were derived from a nearby precipitation measurement station of the Royal Dutch Meteorological Institute (KNMI) in Megen. For estimating evapotranspiration, the Makkink relation (Makkink, 1957) was applied using temperature and net incoming radiation data from the main KNMI weather station in De Bilt.”

p. 1420, lines 2-4: We reached sufficient accuracy with the presented setup.

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Pre-concentration would have been much more labor-intensive and expensive. We changed the text into: "This setup enabled accurate measurements (with a reproducibility limit of ca. 10%) without the frequently applied labor-intensive pre-concentration procedure."

P. 1422, line 7: It's a good idea to add a statistical test on the differences. We will add a table with test results and significance levels and refer to this in the text.

P. 1422, lines 4-14: We have rewritten this section and added a discussion on the magnitude (and significance) of the differences and the implications.

P. 1422, chapter 3.3: See our response to your major suggestion above

P. 1423, lines 5-24: We reduced this section to 2 sentences to summarize our main results (which is a common opening of the discussion section): "In this study, we obtained a spatial image of the propagation of diverted river water into a hydrologically complex polder system during dry and wet conditions. We applied this information for the interpretation of chemical water quality monitoring data and for the evaluation of an integrated water and solute transport model."

P. 1424, lines 7-10: We agree that this sentence is out of place and removed it from the manuscript. In the introduction we already elaborated on the benefits for hydrological modeling (p1414 l24- p1415 l7).

Fig. 1, Fig. 2: Done as suggested

Fig. 4: Yes, NO₃ is in NO₃-N. We changed the notation to NO₃-N throughout the paper to avoid misunderstanding. We will remove the boxplot explanation from figure 4.

Technical corrections P. 1418, line 2: Given the sentence structure we prefer to use the full names here. We removed the abbreviations between brackets as they have already been introduced.

P. 1419, line 5: Done as suggested

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P. 1419, line 9: Done as suggested

P. 1421, line 25: Done as suggested

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