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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Brine migration along vertical pathways due to CO injection – asimulated case study in the North German Basin with stakeholder involvement" *by* A. Kissinger et al.

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Reply to comments of Reviewer #2

We thank Reviewer #2 for thoroughly reviewing the manuscript. We understand that the primary objectives of this study are not clearly formulated and unfortunately, it does not become sufficiently clear what benefits the stakeholders and the geo-modelers gain from the participatory modeling approach. For now, we will not go into detail about specific comments of this review but rather focus on the most important issues concerning the restructuring and splitting of (a) revised manuscript(s). We will, of course, consider all the specific comments in a revised version. We see the main criticism of Reviewer #2 summarized in this statement:

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"I think demonstrating how the stakeholder input changed the results is the critical part of this study and needs to be demonstrated effectively. The discussions could be used to show the implications (if any) of the changes resulting from stakeholder inputs."

Our suggested strategy for a revised version is indeed splitting the manuscript as suggested by both Reviewers #1 and #2. The first manuscript (Part 1) would be ”technically” focused. It would contain a detailed description of the geological model and the numerical model. The results of the scenario analysis and the model simplification would be presented. The key research questions we would like to treat there are:

- Which parts of the target aquifers are prone to salinity increases due to CO2 injection?

- Which are the relevant components of the geological model controlling saltwater migration into the target aquifers?

- What are criteria for choosing different kinds of models/approaches for evaluating brine migration?

Part 1 could provide valuable information, for example, for site operators who have to set up large-scale models for brine displacement under the conditions found in the North German Basin.

The second manuscript (Part 2) would consider the participatory modeling approach in more detail than in the original manuscript. The key questions are there:

- What was the procedure of the PM approach (chronologically and in more detail than before)?

- How did the geo-modelers benefit from the PM approach?

- How did the stakeholders benefit from the PM approach?

- How does the PM approach applied in this work differ from other expert elicitation methods previously deployed (with reference to the literature as mentioned by Reviewer #2)?

Part 2 would provide information on the implementation and the strengths and weaknesses of the PM approach as a toolbox for stakeholder involvement based on the experiences of this study.

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