

Author's response

We first would like to thank the Editor, and both Referees for reading our manuscript again, and for providing additional comments. In our opinion, this helped again to further improve the manuscript.

In the following, our point-by-point response to the reviews is given. We first answer on the comments of the Editor, followed by the answer to the comments of Referee #1 and Referee #2. The line numbers refer to the track-changes document.

Answer to Editor

In the first paragraph, the Editor emphasizes one of the main comments of Referee #1. This comment states that the second research question is not correctly formulated and raises wrong expectations. We agree on this point and modified the manuscript accordingly. (TC: L110-112). We also addressed all other comments of Referee #1 (see answer to Referee #1).

In the second and third paragraph, the Editor addresses the concerns of Referee #2 about the national extrapolation. The Editor states that she thinks this part should not be taken out of the manuscript, but that the concerns of Referee #2 about the uncertainty of the national extrapolation and the issues about lack of validation should be addressed more in the manuscript. We agree that the lack of validation is an important aspect for discussion. We addressed this aspect in more detail in the discussion sections "Extrapolation to the national level" (TC: L726-744), and "Implications for practice" (TC: L767-775). Additionally, we added this aspect to the conclusion section (TC: L886-887) and included a respective sentence in the abstract (TC: L35-36).

In the third paragraph, the Editor additionally states that it should be outlined more clearly how more reliability on the national assessment could be achieved. We addressed this point in the manuscript by extending the paragraph on model validation in the "Further research" section of the discussion (TC: L787-842).

Answer to Anonymous Referee #1

The main concerns of Referee #1 relate to the extrapolation to the national level. The referee mainly criticises that the added value of this part is small, and that the uncertainty of this approach is large. Additionally, the referee states that one should be careful with making recommendations to authorities based on a model which is not validated with field measurements.

We still think that this part has additional scientific value, since it updates a previous national scale model based on additional empirical data. We however agree on the concerns that this extrapolation is subject to substantial uncertainties and that one should be careful about the content and phrasing of recommendations to authorities. We tried to give these aspects more weight in the manuscript and extended the paragraphs on model validation (see answer to Editor). Particularly, we stated the lack of validation more clearly in the “implications for practice” section.

Answer to Anonymous Referee #2

In the following we will give a point by point answer to the comment of Referee #2.

In my previous comment 19, I argued that the 2nd research question could not be fully answered. [...] I suggest to adapt question 2) as follows: What is the contribution of hydraulic shortcuts to surface runoff connectivity and what are implications for surface-runoff related pesticide transport?

We agree on this argument and adapted the manuscript accordingly (TC: L110-112).

And to extend L 536 – 539 ACT as follows: Analogously, if other boundary conditions of pesticide transport remain unchanged, directly and indirectly transported pesticide loads are expected to be proportional to directly and indirectly connected crop areas.

We agree on this comment and adapted the manuscript accordingly (TC: L521-525).

As a general remark: If available, a revision of phrasing, esp. of the M&M section, could make the text easier to read. Some needlessly complicated sentence constructions are: L 212 – 214 [...], L 236 – 239 [...], L 328 – 330 [...], L 362 – 365 [...]

We agree that some of the sentences in the Methods section were too complicated and rephrased the above-mentioned sentences (TC: L212-215, L236-240, L325-329, L356-359).

We also rephrased some additional sentences for better readability.