

First of all we want to thank the three reviewers for the helpful comments. We have already answered the main problems of the reviewers in a letter to the editor on January 24, which was distributed to all reviewers: <https://www.biogeosciences-discuss.net/bg-2017-450/bg-2017-450-AC1-supplement.pdf>. Therefore, in the following we will answer only the specific problems. In accordance with these general comments we have made large additions to the Introduction and deleted parts about the ACASA-model that were repetitions from earlier publications. Comments from referees are presented in black and these are followed by the authors' responses in blue.

## **Reviewer #2**

According to your answer to the letter to the editor we have added a paragraph on advection in the introduction and have added some remarks in Sect. 3.2.4 about the relevance of our paper and the tile approach (this is also related to recommendations made by both of the other reviewers).

We believe that because of the high correlation coefficients in Tables 3 and 4, the result should not be questionable and a replacement by  $R^2$  should not be necessary.