

Main comments

1. The equation for the negative $\lambda - K$ correlation case is incorrect (also noted by reviewer 2)

– The equation (p. 4731, line 1 in the discussion paper) has been corrected and is now written $\lambda = \lambda_g \cdot (K/K_g)^{-1}$.

2. Some discussion on the effects of spatially variable mass input should be included.

– The geographical mapping of advective travel times (Fig. 2) and mass delivery fractions (Fig. 4) are particularly relevant also for spatially variable mass input. This is now mentioned at the end of the conclusion section.

Minor suggestions to improve the text:

Delete the words uncertainty and cross-correlation in the first sentence in the abstract

– The suggested change has been made.

The sentence on line 10 in the abstract is confusing

– The sentence has been changed to “... *neglect or underestimation of the physical advection variability can lead to substantial underestimation of pollutant and nutrient loads to downstream surface and coastal waters.*” The corresponding sentence in the conclusion is changed accordingly.