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Hydrology and Earth System Sciences Discussions

Interactive comment on "Spatial variation of the longitudinal dispersion coefficient in an estuary" *by* D. C. Shaha et al.

Anonymous Referee #3

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The manuscript presents work that falls with the scope of the journal and would be of interest to it's readers. The main value of the paper rests on the presentation of a novel dataset of dispersion coefficients within an estuary over at different spatial locations. It is unfortunate that data was not available which would help determine the relative impact of the various mixing processes as the inclusion of such datasets and analysis would have substantially improved the paper. However, based on the data available worthwhile conclusions are reached. Personally I would like to see the results directly compared to the work of previous researchers in a more accessible manner. The discussion is adequate but I think it would be improved by the inclusion of a table or plot of comparable previous findings. This could then form the basis of the discussion of similarities and differences of findings of previous research. As noted

by other reviews a 1D model has been used to describe the mixing processes, my personal opinion is that the choice of model should reflect the data available and the requirements of the site, and whilst a simplification without detailed measurements of geometry a 1D model may be the best choice for this particular study. Indeed, for practitioners the presentation of 1D dispersion coefficients is probably more useful for reference purposes because cases were users have sufficient data to successfully deploy a 3D model are probably rare. However I do agree that the model choice and associated limitations and uncertainties should be discussed further within the paper. At present there is a lack of detail in the justification of the choice of model, discussion of modelling assumptions, and the associated consequences for the study (both in the generic and site specific sense). I also agree that it would be worthwhile deploying a 3D model in the future should the data be available. In all other respects (title, abstract, clarity, etc) the paper is adequate and if the issues raised above are addressed I would recommend that the paper be published.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 7757, 2011.