

# ***Interactive comment on “Inter-annual variability of dissolved inorganic nitrogen in the Biobío River, Central Chile: an analysis base on a decadal database along with 1-D reactive transport modeling” by M. Yévenes et al.***

**C. Stamm (Editor)**

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Dear Dr. Figueroa

Your manuscript has been evaluated by two anonymous referees. So far, you have not responded to them. To conclude the interactive discussion phase of this submission, please provide detailed answers to these comments. These answers should describe how you would address them if you are invited to revise the manuscript. In addition to the observations made by the reviewers I also add some comments that you should

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consider in your response. These comments are added directly below. Do not yet submit a revised version of the manuscript at this stage. Sincerely

Christian Stamm

Comments by the Editor:

p. 706, L. 22: Based on what data do you conclude that internal production exceeds consumption? What is about input from the catchment area?

p. 707 – 709 (Introduction): Although you use modelling in your work there is no summary of the state-of-the-art on water quality modelling in rivers with regard to nitrate. This is a must. Please state what the consequences are for and what is novel about your work in this context.

p. 707, L. 9: Why do you cite EEA (2010)? This report deals with Europe. I cannot see the relevance for the situation in Chile.

p. 709, L. 8: I would not consider nitrification as a source for DIN because it just transforms N into nitrate. Please comment on the N sources that actually deliver N into the stream (from outside the stream!).

p. 711, L. 5: Are there just 72 samples for the entire study or per site or year? Please specify and discuss the consequences of the sampling scheme for the results.

p. 712, L. 12: Show the river stretch included in the modeling on the map (Fig. 1 and Fig. 4). Explain why you only have considered a rather short stretch for the modelling part.

p. 712, Eq. 1: I miss the N input from the catchment into the stream as a (spatially explicit) source term in the model. Please comment on that.

p. 712, L. 24 – p. 713, L. 1: The in-stream measurements do not provide information on the boundary conditions but the internal state. Boundary conditions would be water fluxes and related concentrations of different N forms. Please explain how you have

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taken them into consideration.

p. 714, L. 5: Fig. 2a does not depict daily flow data but just annual values. Please correct.

p. 714, L. 7: The extreme value distribution needs parameters. How do you obtained them and what are they?

p. 714, L. 25: Fig. 4 does not display the relationship between land use and water quality. Providing such a figure would be useful.

p. 714, L. 27 – 28: What about the input of sewage water (treated or untreated)? Please provide such data because wastewater may contribute a substantial fraction of riverine N.

p. 718, L. 4: Chemical weathering of what?

p. 719, L. 15: Fig. 2b does not show single events.

p. 720, L. 23: Fig. 6 does not show oxygen consumption.

p. 721, L. 8 – 9: Nitrate concentrations will also be strongly influenced by N input from the catchment and from tributaries. Comment on that.

p. 722, L. 21: The influence of land use is not really shown anywhere in the manuscript.

p. 732, Fig. 1: What about the upstream part of the watershed? Why is that area not shown?

p. 733, Fig. 2: Because the data represent annual values points are not an adequate representation. Please use step function (lines where the value remains constant across a year). This is what you actually show.

p. 737, Fig. 6: No labels of the x-axes are provided. Distinguish the points for the two seasons.

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