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Interactive comment on "Tracing biogeochemical processes and pollution sources with stable isotopes in river systems: Kamniška Bistrica, North Slovenia" *by* T. Kanduč et al.

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We agree with referee 1 that other tracers such as d18O in nitrate along the river flow would provide a better insight into the origin of nitrate, but according to our financial budget could not be implemented. Origin of nitrate according to Kendall et al., 2007 to our knowledge can provide semi-quantitative to quantitative estimates of contributions if denitrification can be ruled out such as in Kamniška Bistrica river and quantification of nitrate sources is improved since other isotopic tracers were measured (d15N and d13CPOC) as well as other sources of nitrate in riverine system such as fertilisers, particulate nitrogen, soil and plant litter in river system (Fig. 7b). Based on the budget

that we had and multitracer approach we provide according to Kendall et al., 2007 semi-quantitative to quantitative estimates of nitrate contribution (only with d15N without d18ONO3 tracer).

Since the concentration of Kamniška Bistrica range from 0.01 to 0.11 mM along the river flow in all sampling seasons we consider sulphate concentration in river system low since the highest concentration of sulphate up to 1.12 mM (Kanduč, 2006) were measured in other Sava River tributaries (Sotla, Savinja and Tržiška Bistrica rivers) and therefore we can consider Kamniška Bistrica river as nitrate anthropogenically impacted (in lower flow) and not sulphate impacted river. The origin of sulphate with stable isotopes of sulphur at the mouth of Kamniška Bistrica indicated mixed origin between precipitation and soil (Kanduč and Ogrinc, 2007).

References:

Kendall, C., Elliot, E.M., Wankel, S.D. 2007. Tracing anthropogenic inputs of nitrogen to ecosystems, chapter 12, In: R.H. Michener and K. Lajtha (Eds.) Stable isotopes in Ecology and Environmental Science, 2nd edition, Blackwell Publishing, p. 375-449.

Kanduč T., Ogrinc N. 2007. Hydrogeochemical characteristics of the River Sava watershed in Slovenia, Geologija 50/1, 157-177.

Kanduč T. 2006. Hydrogeochemical characteristics and carbon cycling in the River Sava watershed in Slovenia. Ph.D. Thesis, pp. 141, University of Ljubljana (in Slovene).

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