

## ***Interactive comment on “Nitrate leaching from short-hydroperiod floodplain soils” by B. Huber et al.***

**B. Huber et al.**

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Referee 1: It is good to see work is being done on the nitrogen balance in riparian soils. In my opinion the study could be improved by increasing the depth of sampling. The question is, "Has the study reached the actual movement of nitrate into the ground water?"

Authors: As you can see in Table 1, there is a distance varying between 20 cm and 120 cm between the lower lysimeter and the mean groundwater table. However at larger river discharge, the groundwater table was close or even higher than the lowest lysimeter, which allowed us to observe the reaction of nitrate concentrations at the interface between the unsaturated and saturated zone.

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Referee 1: In a study we were involved in it was possible to assess some of the nitrate inputs. Like you, we were not able to measure all of the nitrate leaving the system. In our study, the periods of flooding and dryness were better known.

Authors: We know quite well the fluctuations of the groundwater table at the study site. A series of 29 piezometers were installed in a transect from the gravel bar to the alluvial forest (transect B in Schneider et al. 2011). We used the daily depth of the groundwater table to simulate the water fluxes (down- or upward) from the unsaturated to the saturated zone.

Referee 1: Some of the nitrate was stored in the soil beyond the reach of plants. This stored nitrate we were able to measure. The soils were in inset alluvial fan positions in a semi-desert environment. Snow floods the soils in these positions in the spring when the snow melts. These soils are known to be Holocene in age and store as much as 17,600 kg of nitrate nitrogen, or 1.8 kg of nitrate per year. Some nitrate would leave the system through the runoff in excess of soil infiltration. So the loss to the system will be greater than the 1.8 kg per year that is stored (Nettleton, W.D. and Peterson, F.F., Landform, soil, and plant relationships to nitrate accumulation, Central Nevada, Geoderma, 2010.).

Authors: Thank you for this reference that we read in the meantime.

Referee 1: Hopefully your work will encourage others to investigate the nitrate balance in other riparian areas.

Authors: Yes, hopefully!

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