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Hydrology and Earth System Sciences Discussions

Interactive comment on "The dynamics of cultivation and floods in arable lands of central Argentina" *by* E. F. Viglizzo et al.

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Comment REF 2:

The authors suggest that the flooding eventually recedes because the increasing extent of surface water bodies results in increased evaporation. This is plausible where there is a concurrent decline in the rainfall, but I would like to see some estimates of what the potential evaporation losses could be and whether they are sufficiently large to account for this. It is possible that PEt could be high given the seasonal rainfall, likely temperatures and high wind speeds but it would be useful to have some specific data.

Reply from Jobbagy, E.:

Tank evaporation (A-tank) records are unavailable for the study region, however, two

stations located in a drier climate, ˜50 km towards the west (Anguil), and in a cooler and moister climate, ˜300 km towards the southeast (Balcarce) achieve values of 2009 and 1011 mm/yr for 1976-2006 (INTA – unpublished data). Even the lowest of these values is higher than those typically reported for annual crops with unlimited water supply (Carcova et al. 2000, Gardiol et al. 2003), suggesting that pond evaporation could become a more effective vapour evacuation pathway than transpiration once flooding expands. This contrast between pond evaporation and transpiration may be even more dramatic if the effects of waterlogging, curtailing water consumption by crops are considered. In this case, water level raises may trigger a positive feedback on flooding in a first stage, caused by transpiration inhibition, but a negative feedback on a second stage, motorized by the high evaporation rates achievable under tank conditions.

References:

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 2319, 2008.