

## ***Interactive comment on “Discharge simulation in the sub-basins of the Amazon using ORCHIDEE forced by new datasets” by M. Guimberteau et al.***

**Anonymous Referee #2**

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Dear Editor and Authors,

General comments

The authors conducted a set of hydrological simulations for the Amazon River using a hydrological model called ORCHIDEE. They improved the performance of their original simulation (ORCH1) by three steps: (1) developed a gridded precipitation data from in-situ observation and substituted it for a global hybrid product NCC (ORCH2), (2) improved floodplain and marsh distribution data (ORCH3), and (3) tuned a parameter for flood plain process (ORCH4). They demonstrated ORCH4 fairly outperformed ORCH1. The authors' research is well focused and organized. Moreover, each simulation is validated and discussed in depth. Particular importance of this paper is various

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gridded data the authors have compiled: their data will be foundations of further better understanding of this basin. I recommend this paper to be considered publication. Because this paper is well written, I have just a few minor comments. Hope some of them are useful to the authors.

Specific comments and technical notes

Page 11174 Introduction: Recently an interesting modeling effort was introduced by Yamazaki et al. (2011), incorporating semi-explicit flood plain process. Yamazaki D, Kanae S, Kim H, Oki T (2011) A physically based description of floodplain inundation dynamics in a global river routing model. Water Resour. Res. 47:W04501.

Page 11175 Line 1 “At the beginning of 20th century” reads “At the beginning of 21st century”

Page 11178 Line 23 “Both discharge into a third reservoir” reads “Both discharge flows into a third reservoir”

Page 11184 “HYBAM” In this paper, it seems the authors use both “ORE HYBAM” and “HYBAM”, which are identical. This is a little bit confusing.

Page 11195 Section 5.1 and Section 6. In this study, river discharge simulation has been improved by three steps: improvement in precipitation data, improvement in floodplain/marsh distribution data, and modification of parameter gFd. What is potential applicability of these measures to other basins? For example, the authors pointed out less reliability of NCC global precipitation data in the northern and eastern Amazon basin, but is there any threshold of raingauge density on precipitation reliability? In which quantitative condition, floodplain/marsh process significantly matters? This kind of generalized discussion would further enhance the importance of this paper.

Page 11223, Fig 8 Legend missing.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 11171, 2011.

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