

## ***Interactive comment on “Rapid channel incision of the lower Pearl River (China) since the 1990s” by X. X. Lu et al.***

**X. X. Lu et al.**

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Author's Response to Referee #2

Referee: The main problem to be solved is to present a kind of a sediment budget for the period investigated (1990-2003). The authors are stating (page 2213, line 1 & 2) in the S903 discussion section that “Because of lack of data, this paper provides A VERY PRELIMINARY ANALYSIS only from the aspect of sediment depletion.” This needs in a way to be overcome in order to publish this paper as a journal paper and not as a conference contribution.

Author: A sediment budget from Peng et al. (2003) was presented in this paper, which presented the sediment deposition rate in the Pearl River Delta. So it is possible to

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compare the sediment extraction rate and the sediment deposition rate, and consequently to draw the conclusion that the sediment mining plays a dominant role in causing channel incision.

Referee: In any case, the title seems to be very promising, and should be broadened to incorporate words such as "sediment depletion"; as the main cause of rapid incision.

Author: The title has been modified to Rapid channel incision of the lower Pearl River (China) since the 1990s as a consequence of sediment depletion.

Referee: In Figure 8 data on sediment loads are given, and there is a clear decrease in loads in the investigated period 1990-2003. Are these loads suspended loads or total loads, including bed load? Please, add some explanation, even though these loads were measured following the related Chinese national standards (page 2209, line 20). Furthermore, in the paper Zhang et al. (2007a), published in Global and Planetary Change, there are definitely valuable data for this paper with regard to the sediment budget. Also the paper Peng et al. (2003) may have some valuable data as well.

Author: In Figure 8 sediment loads should be suspended load, which has been corrected in the revision. Some data from Zhang et al. (2007a) and Peng et al. (2003) have been cited in this paper. For example, the dominant sediment supply (suspended load) source to the Pearl River Delta is pointed to the Xijiang River according to the data in Zhang et al. (2007a), which is introduced in the part of study area. Also, the sediment budget from Peng et al. (2003) has been cited in the paper for making comparison between the sediment extraction rate and the sediment deposition rate, which is useful for identifying the role of sand mining on channel incision.

Referee: Also, any sediment related data (mean size, maximum size, sorting coefficient, etc.) should be presented. The same is true for (annual) sediment transport capacity that should be compared to annual sediment extracted through mining from the river (page 2213, line 6) and to average incision, knowing sediment loads. Is this

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comparison already presented in the paper Zhang et al. (2007a) ?

Author: Sediment related data, such as grain size has been presented in the part of study area. The annual sediment extracted through mining has been compared with sediment transport (both suspended and bed load) as well as the sediment deposited in the Pearl River Delta. Such kind of comparisons are not available in the paper Zhang et al. (2007a).

Referee: Figures 2 and 3 are not easily readable when presenting 14 curves in one graph. I would suggest to present less curves but covering the whole period (leaving out at least half of curves).

Author: Figures have been greatly improved owing to the suggestions of two referees.

Lastly, the authors would like to express great thanks to two referees for their constructive comments to improve this manuscript.

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