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Earth Surface Dynamics Discussions

Interactive comment on "Development of a meandering channel caused by the plane shape of the river bank" *by* T. Nagata et al.

Anonymous Referee #2

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This paper presents the possible mechanisms of the occurrence of the extensive bank erosion. Even though the results are not sufficiently generalized, they are expected to provide new knowledge on the bank erosion processes during recession periods of floods.

Although it provides the important information, several points in the paper must be stated more clearly. I have six comments.

1. The locations and the geometry of the river works in fig. 4 must be illustrated more clearly. They might have the strong influences on the restrictions of the planar form of the river channel. It is preferable that possible effects of major river works on the channel formation are described.

2. In section 3, it is described that the analysis was performed at 1/100 scale. It is preferable to address again in this paper why this downscale was required and why the authors think it is not problematic in order to investigate the mechanisms of the specific event in the environmental scale.

3.The authors describe that the one of the reasons to perform the calculations for Section-1 is to study the riverbed response for the steady flow. However the discharge condition of this calculation seems unsteady (fig. 8). It must be addressed that how the authors think this results can provide the information for the steady flow.

4. In p.1028 L.16, the authors wrote "this probably because. . ." The process of the development of M-1 possibly rely on the boundary conditions of the downstream end of the calculation region. The details of the boundary conditions must be clearly described. It is then required to describe again the development process of M-1 in relation to the boundary conditions.

5. In section 3.5, if authors need to address the development process of the point bars (M-1 to M-3) in terms of the channel curvature, it must be explained that how the stability of the locations of the sandbars were affected by the curvature difference. It is preferable to show the some major evolution steps of representative cases.

6. In section 4.1., it is stated that M-1 is the key of the channel formation in the downstream section. The authors need to explain more details why such a very specific feature of the channel can play the dominant role on the channel bed evolution in Section 2. As the authors describe in the previous sections, characteristics of the general channel topography of Section-1 and Section-2 are different. Is there any possibility that the knickpoint of these general characters between two sections plays the major role on the channel development in the downstream section?

Interactive comment on Earth Surf. Dynam. Discuss., 1, 1019, 2013.