

Jack Middelburg,
responsible editor for this special issue of Biogeosciences

Feb 10, 2024

Revision of Manuscript ID: BG-2023-180 "The dynamics of marsh-channel slump blocks: an observational study using repeated drone imagery " by Yang et al.

Dear Editor,

Enclosed please find the revised version of the above manuscript after our revision, submitted for possible publication in *Biogeosciences*.

The paper was previously assessed by two anonymous reviewers, the associate editor and the editor, who suggested the revised manuscript will eventually be publishable.

In this current revision, we have complied with all recommendations for change which are well documented in our Response Letter. All suggestions to improve the manuscript have been incorporated into the new version, as requested by you and the reviewer.

We wish to thank you and the reviewer for the thorough review work and the very useful suggestions and comments, which allowed us to significantly improve the quality of our paper.

We look forward to an acknowledgment of receipt and, hopefully, to a rapid acceptance of our paper for publication in *Biogeosciences*.

Sincerely Yours,

Zhicheng Yang,
on behalf of all of the authors

RESPONSE TO COMMENTS ON bg-2023-180 FROM Reviewer #1

We wish to thank the Reviewer for her/his positive assessment of this manuscript. We also want to thank the Reviewer for her/his thorough review which helped to improve the quality and clarity of our manuscript.

Please note that in this document, *italics* refer to the text of the reviewers' comments, our detailed responses are in black, the old version is in ~~strike through~~ and the new text of the revised version is in **bold blue**. Line numbers refer to the revised version of the manuscript.

The authors answered to my comments and requests. The paper is clearer compared to the previous version and I want to congratulate with the authors for the work. I haven't seen improvements under the point of view of the content, but the authors answered to my comments. All the knowledge is strictly limited to the information obtained from the aerial images, so without any integration of other data of different nature (e.g. sedimentation rates) interpretations are necessarily limited. However, this is probably the point of the study, to keep it simple. I only have these last observations/ comments to point out. Here I refer to the points you named in the author response:

- *Point 3. Ok, I appreciate that you will take a step further in sedimentation analysis in the future. However, are there any values regarding sedimentation from literature? Although you cited Gabet (1998) saying "that local sedimentation rates in marsh-block gaps were approximately 1.5-2 times higher than on the adjacent salt marsh platform", it does not help to understand the magnitude of the sedimentation of the study area. It can give an idea of the typical rates of this area and, most importantly, it gives a meaning to the sentence you added; otherwise, without any reference value, it is not comprehensible.*

As far as we know, there is no literature focused on our study area reporting sedimentation rates within the gap between marsh platform and slump blocks. To provide insight for readers into the differences in the magnitude of the sedimentation, we have modified the text by adding the sedimentation rates observed by Gabet (1998). The new text reads (Lines 389-390) "**but Gabet (1998) found that local sedimentation rates in marsh-block gaps (about 90 mm/year) were substantially higher than on the adjacent salt marsh platform (1-55 mm/year) in a tidal channel in San Francisco Bay, California.**"

- *Point 6. I beg to differ since the definition of "marsh" necessarily needs the presence of vegetation; if there is no vegetation, then it should be called tidal flat. However, in this part of the paper you are talking about the spatial changes of vegetation, hence I suggest to simply change as follow:
L29: "Marshes are dynamic environments and the area of vegetated marsh colonized by vegetation can change over time, not only as the result of progradation or retreat of the open-fetch marsh edge..."*

We agree with the reviewer's comment. We have modified the text in Lines 29-31 from "~~Marshes are dynamic environments and the area of vegetated marsh can change over time, not only as the result of progradation or retreat of the open-fetch marsh edge~~" to "**Marshes are dynamic environments and their vegetated area can change over time, not only as the result of progradation or retreat of the open-fetch marsh edge.**"

Here I add some more comments (referred to the clean version of the paper):

L100: “Images used in this study were cropped from larger images (Lynn et al. 2023). Briefly, these images...” High repetition of the word “image”. Maybe you can use other terms, maybe “orthophoto”? Also, I think it is correct to say “The images used in this study...”

We agree with this comment. We have edited the text from “~~Images used in this study were cropped from larger images (Lynn et al. 2023). Briefly, these images were acquired using a DJI Matrice 210 UAV equipped with a MicaSense Altum sensor during morning low tides within 1-2 hours of solar noon.~~” to “**The images used in this study were cropped from larger orthophotos (Lynn et al. 2023). Briefly, these data were acquired using a DJI Matrice 210 UAV equipped with a MicaSense Altum sensor during morning low tides within 1-2 hours of solar noon.**”

L304: “...although most slump blocks submerge over time...” This is not correct, since you showed that most of the blocks reconnected while just a part submerged (652 vs 234 m²). I understand that you do not want to suggest that the block submergence is not important, but I would avoid to use this sentence.

We agree with the reviewer. We have modified the text from “~~Second, although most slump blocks submerge over time, some of them reconnect to the intact marsh platform.~~” to the next text, which reads “**Second, some slump blocks submerge over time, while some of them reconnect to the intact marsh platform.**”

It would have been nice to improve this analysis with the use of DSMs or sedimentation rates, but as you said, it can be the next step of the study.

Thanks to the reviewer for this constructive suggestion. We will analyze changes in slump blocks and dynamics based on DSMs and measure sedimentation rates in the future.