

# ***Interactive comment on “River restoration: morphological, hydrological, biogeochemical and ecological changes and challenges” by M. Schirmer et al.***

**M. Schirmer et al.**

mario.schirmer@eawag.ch

Received and published: 12 November 2013

To

Associate Editor Insa Neuweiler of Journal Hydrology and Earth System Sciences

Dübendorf, 12.11.2013

Answer to reviews on manuscript HESSD 10, 1-29, 2013

"River restoration: Morphological, hydrological, biogeochemical and ecological changes and challenges " by Mario Schirmer et al.

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Dear Dr. Neuweiler,

Please find below our answer to the four reviews on our paper 'River restoration: Morphological, hydrological, biogeochemical and ecological changes and challenges' by Mario Schirmer, Jörg Luster, Niklas Linde, Paolo Perona, Edward A.D. Mitchell, D. Andrew Barry, Olaf A. Cirpka, Philipp Schneider, Tobias Vogt for possible publication as HESS research article.

Overall comments concerning all four reviews (specific comments to the single reviews are provided below):

We realize that the real objective of our paper did not come across. We tried to give a short overview of the literature and then present results of our interdisciplinary research project RECORD (Assessment and Modeling of Coupled Ecological and Hydrological Dynamics in the Restored Corridor of a River (<http://www.cces.ethz.ch/projects/nature/Record>)). In this way, it is a synthesis paper which is by nature a difficult task to accomplish. 14 PhD thesis resulted from the project, therefore, we will present the main findings of those and the interrelationships here. To overcome the gap between our intention and what came across in the manuscript, we suggest the following changes to our manuscript.

1. We introduce the RECORD project in the abstract and state our objective to provide a synthesis of an interdisciplinary project.
2. We try to shorten the Introduction to leave out common knowledge.
3. If possible, we will try to combine Section 2 "Riparian and hyporheic processes" with our case study.
4. Section 3 "Case study" will be extended. New results and links are given since the RECORD project is finished now and all PhD projects are finalized. Furthermore, we will try to show better the links between the single projects and the added value of the interdisciplinary approach which goes far beyond the single projects being added.

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5. Section 4 “Lessons learned at the Thur River” will be renamed to “Discussion of the RECORD results” and we will focus more on the particular findings at the Thur River and what can be transferred to other sites.

6. Section 4.5. “What are the implications of our research for future restoration projects? Will be a new section and renamed to “Implications of our research”. We will extend this section by elaborating on research demands including the crucial need of interdisciplinary research approaches for river restoration projects.

7. We will adapt Section 5 (new section 6 if old Section 2 remains in the manuscript) to the reworked structure and focus of the manuscript.

Specific comments to the reviewers

Reviewer 1:

1. Reviewer 1 fundamentally criticises our manuscript. We hope with clearly stating the scope of our paper and the main objective this criticism can be overcome.
2. We will try to show the links between the different projects. Most of the results are published or are in press and are referred to as references.
3. We will handle the specific comments according to the overall comments as described above to satisfy reviewer 1.
4. The study site is described in detail in Schneider et al. (2011) as referred to. However, we can include a short paragraph on the study site characteristics.

Reviewer 2:

1. Reviewer 2 misses a description of what our manuscript is trying to accomplish. As stated in the overall comments, we will make clear that this is a synthesis paper.
2. By extending Sections 3 and 4, we will be more quantitative. However, we will not show results that are already published elsewhere.

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3. The last paragraph of the “General comments” concerns the structure of our manuscript. By explaining our goal we want to reach with our paper, namely, to give a synthesis, we try to avoid the structure of a “normal” research article.

4. We thank for the specific comments and corrections which we will incorporate.

Reviewer 3:

1. Reviewer 3 also misses the goal of our manuscript. As stated above, we will clarify that our manuscript is a synthesis paper on RECORD.

2. In Section 3 “Case study” we will try to show better the links between the single projects and the added value of the interdisciplinary approach and add a statement on the crucial need of interdisciplinary research approaches for river restoration projects.

3. The focus on RECORD results will hopefully satisfy the request of Reviewer 3 in terms of novelty, as stated in the second paragraph of the review. We will evaluate the paper Brantley at al. (2011) and incorporate the idea of Critical Zone Observatories.

4. Line edits as suggested will be done.

Reviewer 4:

1. Reviewer 4 requests a longer set of replies to the four questions we pose in the Introduction. As Section 4 will be extended, we try to overcome this deficit.

2. We will more explicitly address the successes and failures, as requested.

We would like to thank you and the four reviewers for their helpful suggestions.

Thank you very much.

Sincerely yours,

Mario Schirmer on behalf of the authors

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 10913, 2013.

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