Nat. Hazards Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/nhess-2018-253-RC3, 2018

Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Low-hanging fruits in large-scale fluvial landscaping measures: trade-offs between flood hazard, costs, stakeholders and biodiversity" *by* Menno W. Straatsma et al.

Anonymous Referee #3

Received and published: 24 October 2018

General comments

My thanks to the authors and editors for the opportunity to review this manuscript. There are many aspects of the processes reported in this manuscript that resonate deeply with my experience working with government agencies and stakeholders in floodplains of large rivers of North America. I think it is a useful manuscript that will provide a good example for numerous other planning efforts.

Specific comments

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Discussion paper

I would start with a request to define some terms to gain a broader understanding among an international audience. Different river-management communities and languages have different terms for river features, and it would help improve communication if the authors invested in a few words to define terms. For example: For many – but perhaps not all – North Americans would expect that “landscaping” means planting flowers and shrubs for aesthetic purposes. Landscaping in the context of this manuscript is reconfiguration of the channel-floodplain geomorphology, essentially terraforming. Similarly: groynes = wing dikes, or more generically, channel-training structures. Embankments = levees. Braid hedge = I have no clue. Etc. I do not recommend abandoning the European terms; I’m simply requesting a parenthetical definition to help in the translation.

I found the scale, scope, and approach were very useful in the context of regional planning. The value was readily apparent in the multiplication of scenarios as channel configurations, roughness, upstream hydrology, and sea-level rise scenarios were combined. Granted, the hydraulics are simplified, but I believe the modeling would be useful in other at a planning level to filter scenarios for efficiency and to educate stakeholders about the opportunities and constraints.

I was surprised that floodplain sedimentation was not a bigger issue in scenarios, especially with floodplain lowering. Toward the end of the manuscript the authors assert that the sediment load of the river is diminished due to upstream reservoirs, but presumably is not zero. Would lowering scenarios also require long-term maintenance to continue to clean out sediment? It would be beneficial for the authors to address sediment and sedimentation dynamics.

The ecological scoring for floodplain vegetation seems limited, as the scenarios included only two treatments. North American floodplains left fallow are normally rapidly colonized by successional tree species which can have additional ecological value, especially as bird and mammal habitat. The tradeoff, of course, is that the woody communities can impart substantially greater flow resistance. The authors assert (p. 9) that

stakeholders view flood safety as the main objective, but it is not clear that the tradeoff with a broader range of ecological value was adequately evaluated. It would also be useful to evaluate a “natural” roughness condition as a reference condition.

For context, it would be useful to add whether or not there is aggregate extraction (or other dredging) from the channel as well as the floodplain.

There is an apparent miss-citation of a figure on p. 6. Figure 3e should be figure 2e.

On p. 8 the citation of 2.5% probability for the 1.8 m setup of downstream water level should be clarified. Is this an annual probability? What additional climate change assumptions are behind this?

This also brings up my final comment: in reality the objectives would probably be subjected to additional weighting, as is typical in multi-criteria structured decision making. Explicit weighting would change the scores and tradeoffs. If flood-risk reduction is the dominant objective, it would be weighted accordingly. In the US it is often the case that ecological objectives get weighted much higher than some of the socio-economic objectives because of special treatment for threatened or endangered species.

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