

Review

A risk-based, network analysis of distributed in-stream leaky barriers for flood risk management

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The text has been analyzed twice:

1. Iteration: questions and error detection
2. Iteration: cross checking fulfilling the declared aims and answering the scientific questions

Iteration 1:

<questions and error detection ready, but not typed in, delivered if necessary>

Iteration 2:

Deliveries and scientific questions as defined by the author Barry Hankin.

Check of deliveries:

- Delivery of network based model. Fulfilled. (215 lines matlab- code; 25 lines calculation, 190 lines I/O and plotting)
- Rapid assessment. Fulfilled.
- Design advice. Not fulfilled. (No quantification, the given design proposal is not derived from the network model)
- Understanding of effective risk reduction strategies. Partially fulfilled. (advices are given, but on a predictable level)

Check of scientific questions:

- Effective dynamic utilization of storage at network dam placements. Partially fulfilled. (There is no criteria given how effectiveness is defined in this context. The effectiveness is not exactly quantified. The effect for the given examples is low. The effectiveness is not linked to the given design flood.)
- Identification of placements that reduce the risk of (cascade) failure. Partially fulfilled. (just qualitative analysis possible, because both dam leakage and fragility are not known.)
- Do small-scale interventions using NFM (Natural Flood Management) combine to create a large scale benefit at large scale? Not fulfilled. (No definition what a large benefit in a large scale is. No model investigation carried out analyzing this particular question. The models used are by far too small.)

- Reliability and performance of NFM-measures under plausible hazards. Not fulfilled. (No plausible hazard given. The test case with $Q_{max} = ca. 10m^3/s$ is completely synthetic. The case study area is not given, but the small N100 resulting in $Q_{max} = 0,5m^3/s$ indicate a very small catchment area, which probably is not representative.)
- Resilience of a network of NFM-measures. Not fulfilled. (Resilience is neither defined nor addressed in the results.)

Missing:

- Definitions on effectiveness, resilience and “large benefit at large scales”
- Hydrological aspects (f.i. definition of design hydrograph, impact of convective or orographic rainfall events on efficiency)
- Ecological aspects
- Arguments for the development of the network model (there are well-proven 1d-tools as MIKE11 or HECRAS)
- Validation of proposed network model for normal flow conditions and dam-break

Facit: Very basic; right questions but weak method.