Development of a Standard Testing Framework for Evaluating Temporary Flood Barriers

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Seventh International Conference on Flood Management (ICFM7)

5 - 7 September 2017

“Resilience to Global Changes - Anticipating the Unexpected”

University of Leeds, UK

Book of Abstracts

Oral Presentations

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KEYWORDS: floods, flood risk reduction, extreme weather, innovation, climate adaptation, temporary flood barriers

ABSTRACT

Floods are the costliest and deadliest weather-related disaster globally. With higher population density in flood prone areas, increased urban development, and projected climate impacts, the frequency and severity of flooding in Europe is predicted to rise. While permanent flood defences have been shown to be more economically effective and reliable in the long-term than temporary flood barriers, they are expensive upfront, socially and politically complex, and time-consuming to build (Lendering et al., 2015). To adapt to climate change and mitigate flooding in the short term, it will be necessary to identify and test temporary flood barriers which can be quickly deployed during a flood event to mitigate risk. Moreover, in some areas, where permanent structures may be phsyically (or socially) infeasible, temporary (or semi-permanent) flood barriers may become a permanent strategy for mitigating floods.

Sandbags have traditionally been used as temporary flood barriers for emergency deployment. However, they are labor intensive and time consuming to construct, and they generate considerable solid waste and require significant clean-up effort after the hazard has passed (Biggar and Masala, 1998; Wibowo and Ward, 2016). To overcome these limitations, temporary flood barriers have been developed as alternatives to sandbags. In many cases, these innovative measures are easier to handle, faster to deploy, easier to remove, and often perform better than sandbags. Nevertheless, they have not been widely tested in operational environments, and skepticism about their performance and lack of a standard testing protocol has inhibited their uptake by water authorities and municipalities (Delfland Waterboard, 2016).

In this paper, we propose a standard testing framework for evaluating the technical effectiveness of temporary flood barriers in laboratory and operational environments. The standard testing framework is applied to **three** inovative flood barriers and their technical effectiveness in terms of re-usability, effectiveness and reliability is compared to the literature on sandbags.

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