

**Prof. Dr. Sandra Soares-Frazão**

Universite Catholique de Louvain

### Why conducting dike breaching experiments?

November 14<sup>th</sup>, 2025, 11:30 -13:00  
KIT, Bldg.10.83, seminar room IWU  
or online:

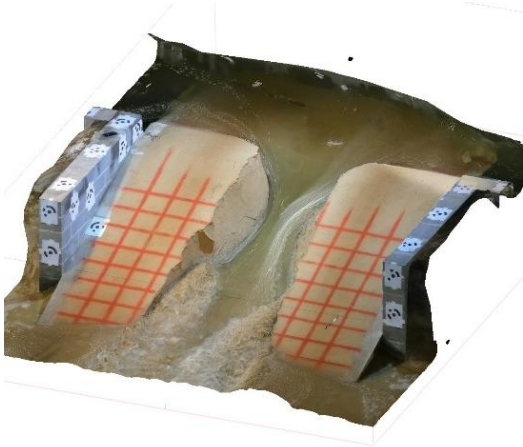
<https://kit-lecture.zoom-x.de/j/65427431353>

Meeting-ID: 654 2743 1353

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# Why conducting dike breaching experiments?



Breaching of a sand dike, reconstructed from SfM-photogrammetry – Experiments conducted at SPW-MI facility in Châtelet (Belgium)

## Abstract

Climate change increases the probability of dike failure mainly because of raising water levels (overtopping), stronger hydraulic forces (waves, surges, discharges), and weakening dike materials through either excess water (saturation, seepage) or lack of it (drought cracking). This means higher risks of overtopping, erosion, piping, and slope instability, which are the main dike failure mechanisms. With more than 100 000 km of dikes and levees protecting coastal areas and river flood plains all over the world, it is crucial to develop our knowledge of failure mechanisms. International databases collecting data about real events allow to identify the main causes of failure. However, to gain a better understanding of the physical mechanisms leading to failure and of the parameters influencing this process, laboratory experiments also play a significant role, when conducted in a sound and reliable way, with a clear identification and control of the studied parameters and using appropriate measurement techniques.

In this talk, we will discuss more specifically the requirements for conducting reliable experiments and monitoring techniques based non-intrusive devices such as digital imagery. The discussion will be based on recent experiments conducted at a small scale in the hydraulics laboratory of UCLouvain-iMMC (Belgium) and at medium scale in the hydraulics laboratory of SPW-MI in Châtelet (Belgium).

## Biography

Sandra Soares-Frazão is a full professor and researcher at UCLouvain, within the iMMC institute (Mechanics, Materials and Civil engineering). She teaches Hydraulics at the Bachelor and Master level to students of the Louvain School of Engineering (EPL). Her research activities relate to fluvial hydraulics, fast transient flows, flood propagation, sediment transport, bank erosion and breach formation in earthen dikes. The research projects she is involved in cover fundamental research, experimental and numerical modelling, and applied research with a special focus on developing countries, such as the ongoing project on flood propagation in Haïti, financed through the Belgian scientific cooperation (ARES-CCD) that she is leading. She is actively involved in IAHR (International Association for Hydraulic Engineering and Research) and was recently recognized as IAHR fellow. With the “Fluvial Hydraulics Committee” of the association, and in collaboration with the Journal of Hydraulic Research, she is currently guest-editing an article collection about “Breaching of Earthen Dam and Dike Structures: Lessons Learned from Recent Field, Laboratory, and Numerical Studies” (<https://www.iahr.org/index/detail/1897>).