Calibration and validation of 3D numerical models of a straight channel with leaky barriers

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Objective and Scope

Under the statement:

"We do not need to stop building; we need to build different"

It highlights a shift in thinking about construction and development. It suggests that rather than halting building projects, there's a need for innovation and change in how we design and construct buildings, focusing on sustainable, efficient, and community-focused approaches.

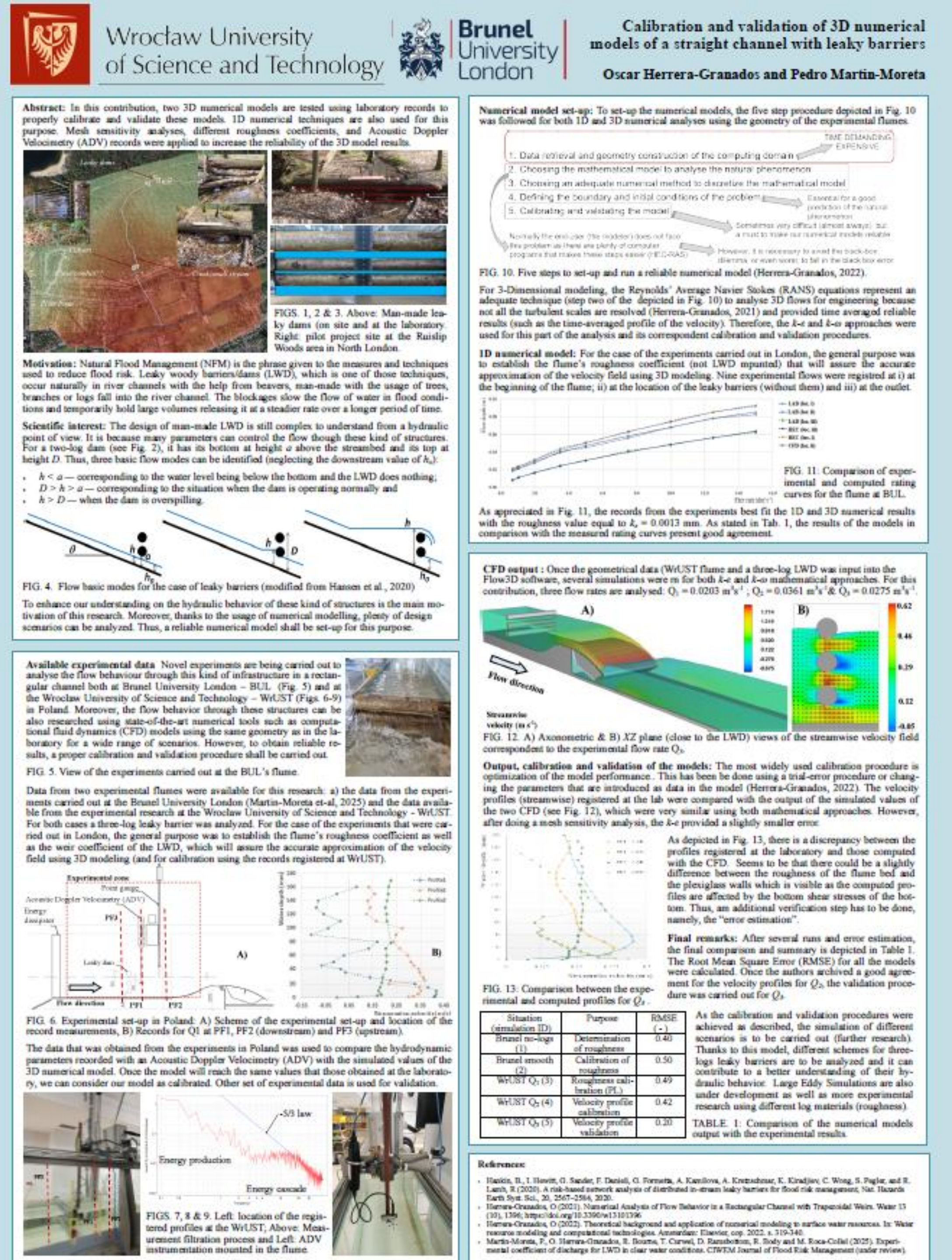
It also concerns new alternatives and approaches to consider modern and **more green infrastructure** against flooding at all planning scales.

Case study

Leaky barriers, as a new method of flood defence, are gradually used in flood management especially in small rivers due to functions of the engineering in ecological and connecting rivers and regulating floods. Understanding the hydraulic effects and especially the backwater rise caused by leaky barriers is necessary to assess its impact and optimize the design.

Figs. beside:

A) Leaky dams in Ruislip woods (London);
B) Experimental model at Brunel UL and
C) Experimental model at the Wrocław UST (Poland).



Contents

As the calibration and validation procedures were achieved as described in this contribution, the simulation of different scenarios is to be carried out. Thanks to this model, different schemes for three-logs leaky barriers are to be analyzed and it can contribute to a better understanding of them. As stated in Table 1, the RMSE are small enough to consider the model as reliable.

Situation (simulation ID)	Purpose	RMSE (-)
Brunel no-logs (1)	Determination of roughness	0.40
Brunel smooth (2)	Calibration of roughness	0.50
WrUST Q_1 (3)	Roughness calibration (PL)	0.49
WrUST Q_2 (4)	Velocity profile calibration	0.42
WrUST Q_3 (5)	Velocity profile validation	0.20

We invite you to check our poster.

Thank you very much for your attention

Let's discuss during the poster session

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