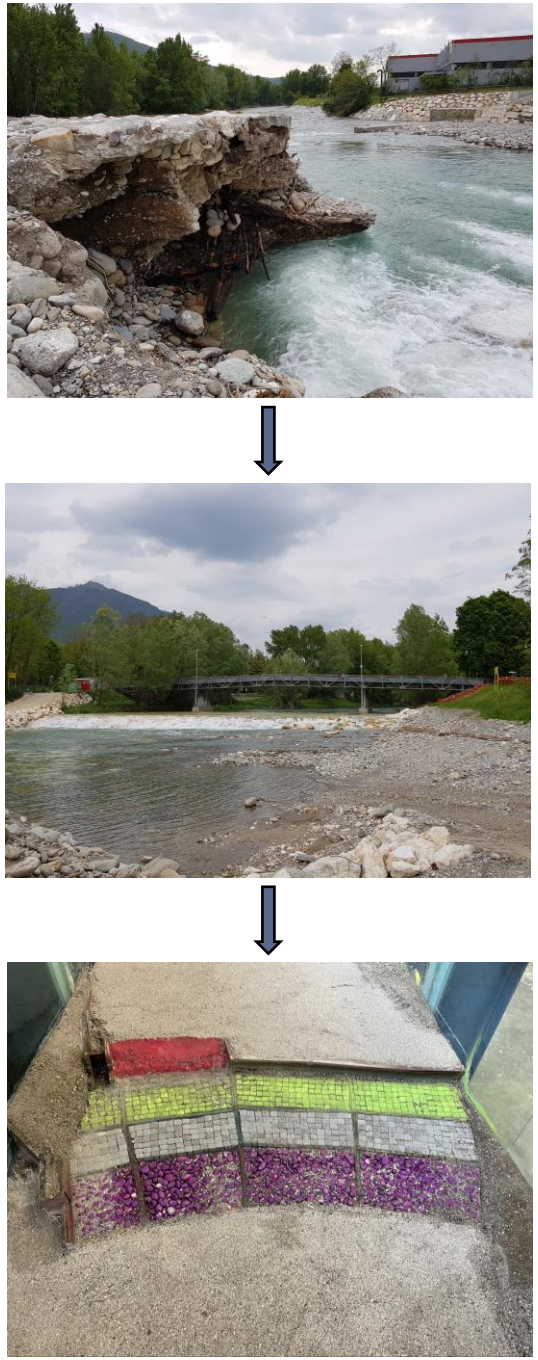
European Geosciences Union – General assembly 2022
Vienna, Austria & Online | 23–27 May 2022

NH9.5 – Natural hazard impacts on technological systems and infrastructures

Safety assessment of historical barrages and hazard cascades following their failure: the Roggia Morlana case study



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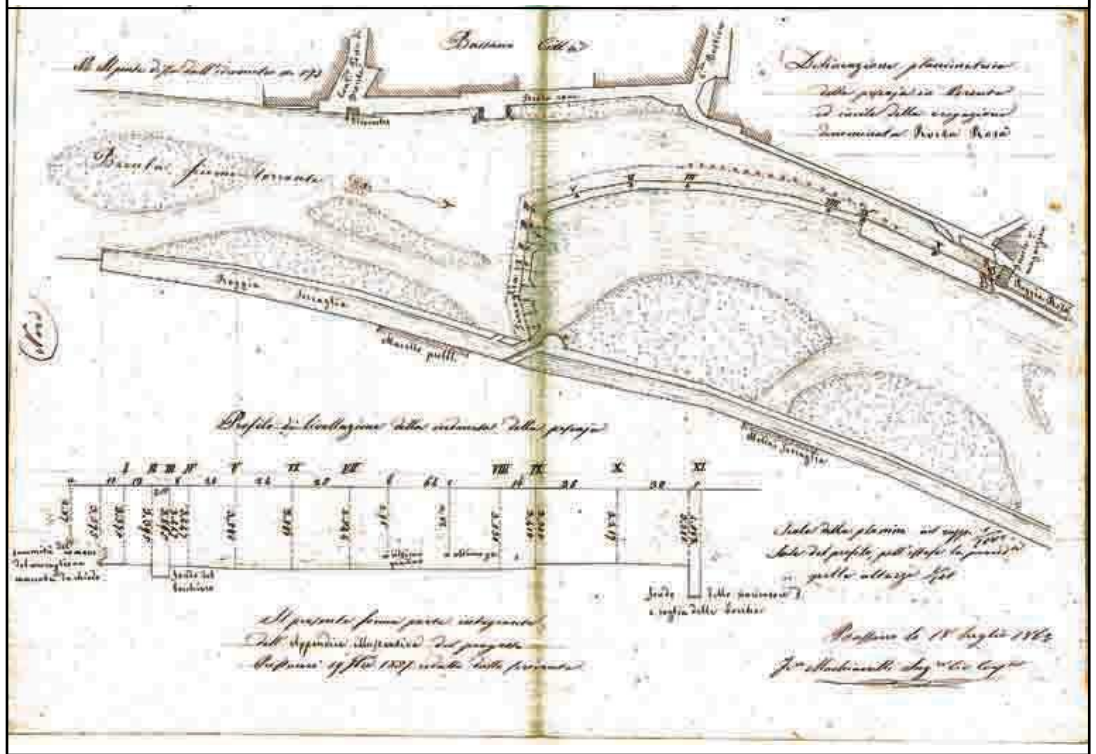
Hystorical barrages

Sometimes, barrages have been present for a long time and act as an inherent element of the surrounding environment

Planimetry of the Medoaco barrage (**since 1623**), Brenta river

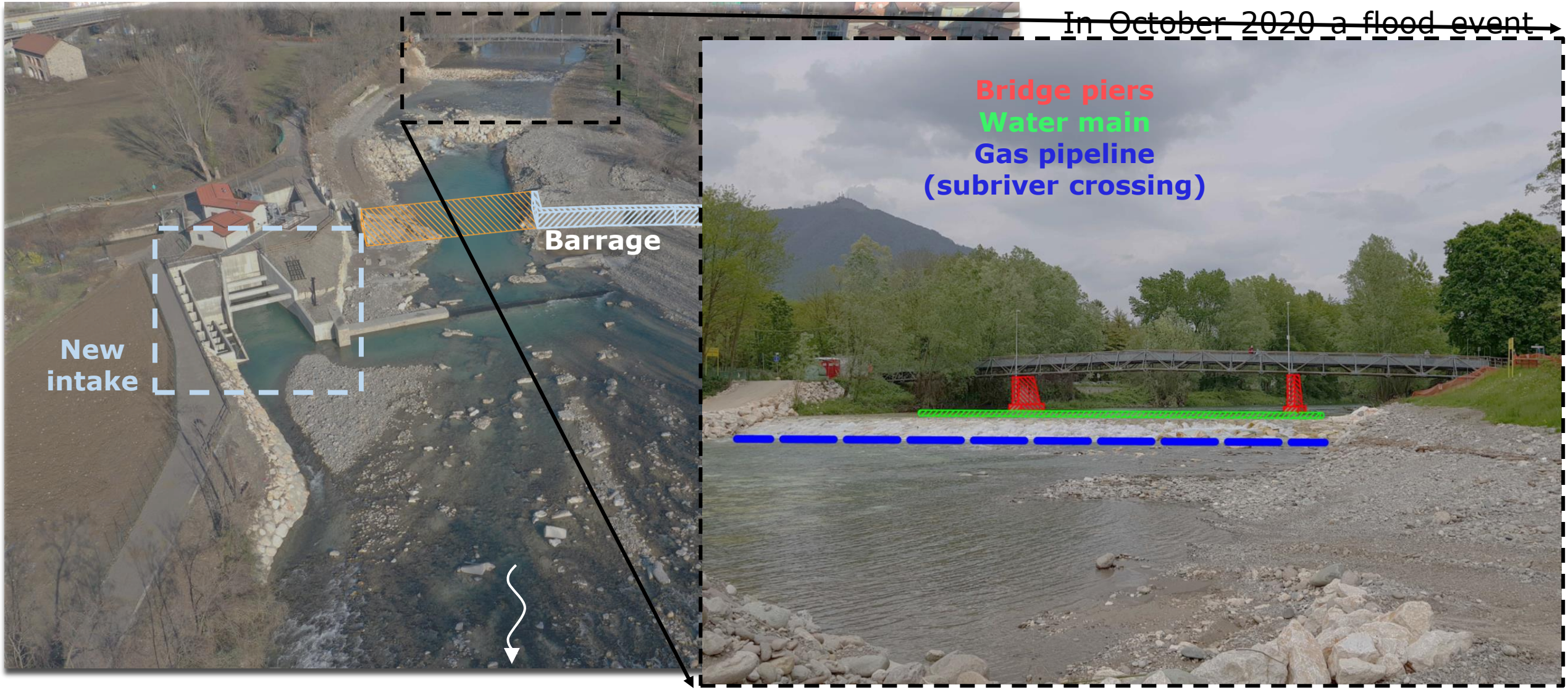


Archivio storico del Consorzio di bonifica Pedemontano Brenta, 1863

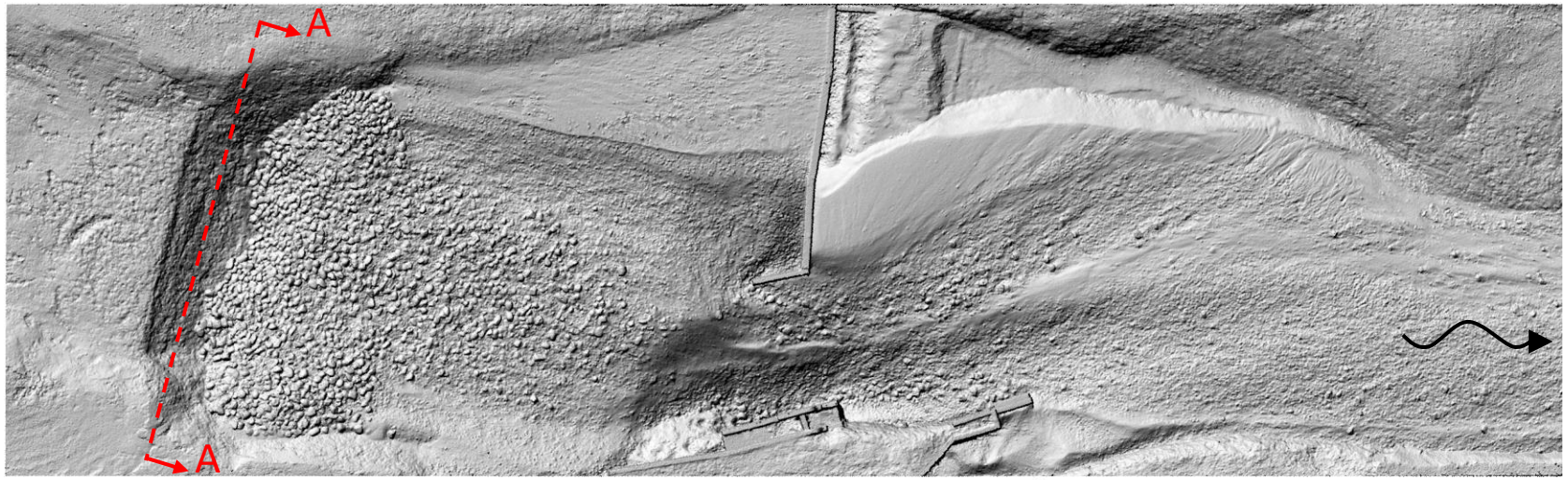
Planimetry of the Roggia Morlana inlet (**since 1200**), Serio river

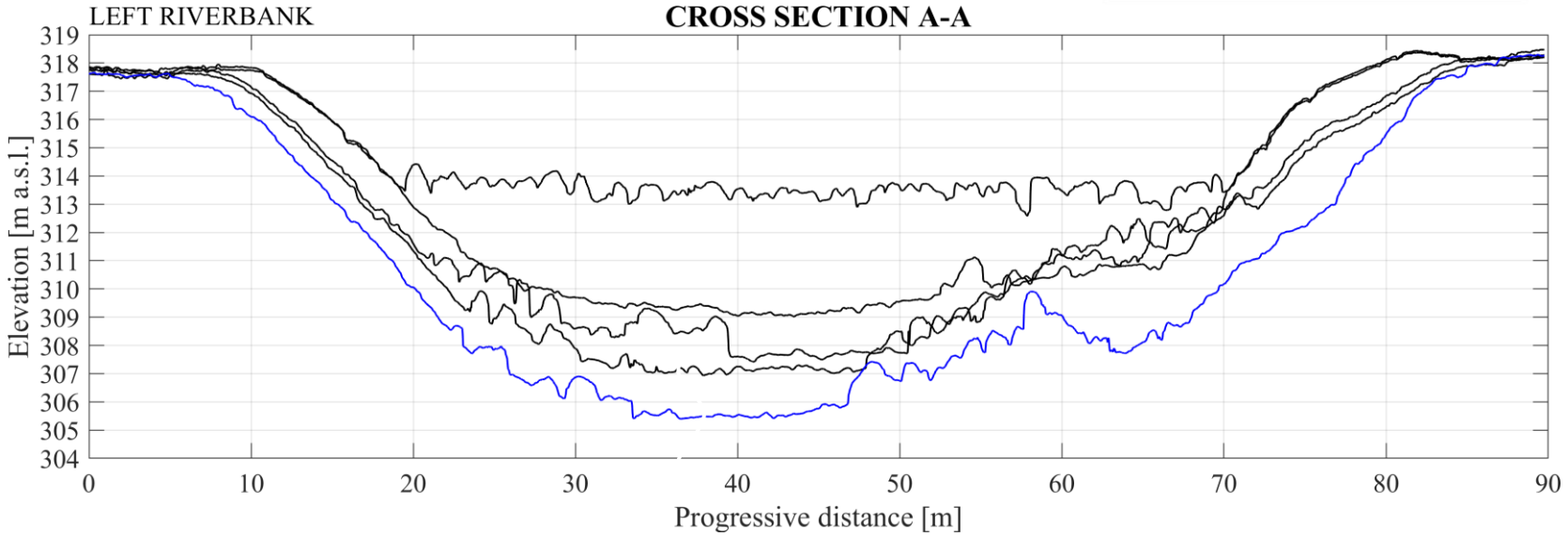
University of Bergamo – Centro Studi sul Territorio 'Lelio Pagani', 1808

The Roggia Morlana barrage



What happens increasing flood events?

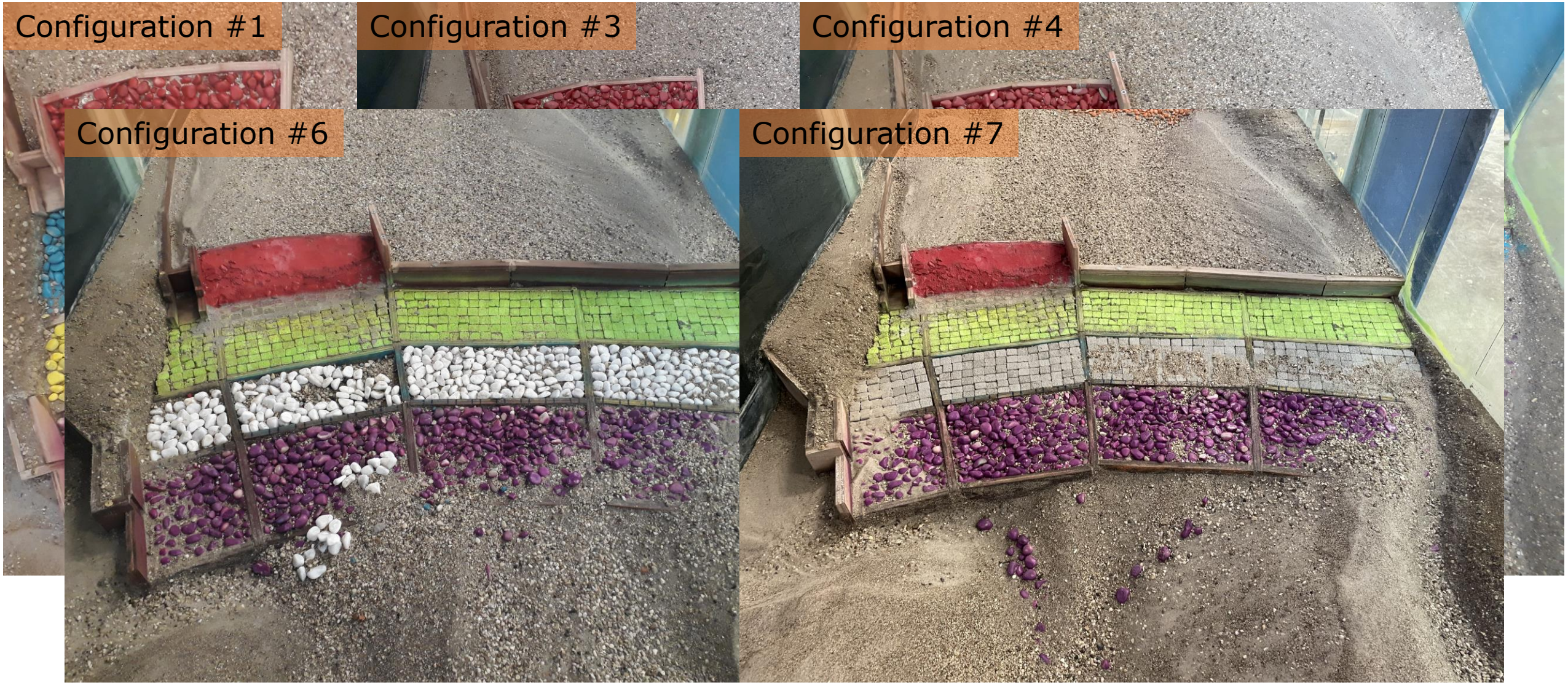




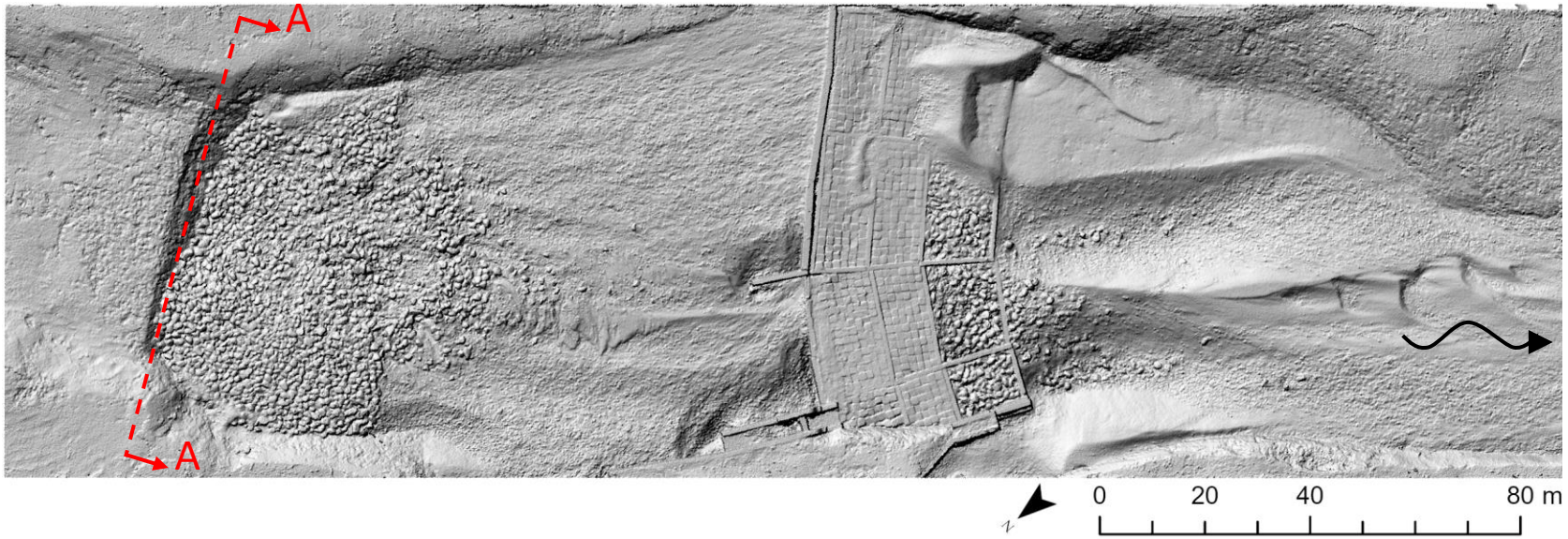
$Q_{failure}$ = 200 m³/s | p = 71%

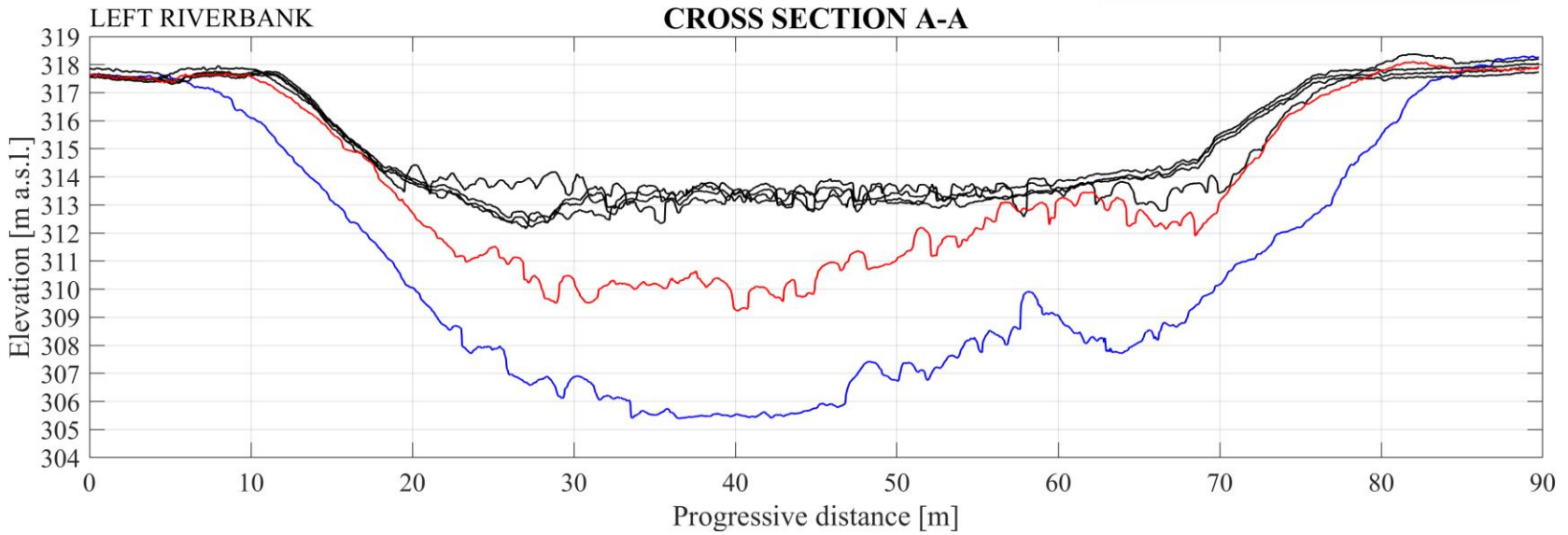
ORIGINAL RIVERBED
Q = 350 m³/s | p = 22%
Q = 492 m³/s | p = 5%
Q = 578 m³/s | p = 2%
Q_{design} = 714 m³/s | p = 0.5%

Barrage rehabilitation and riverbed protection assessment



A proper riverbed protection is fundamental...





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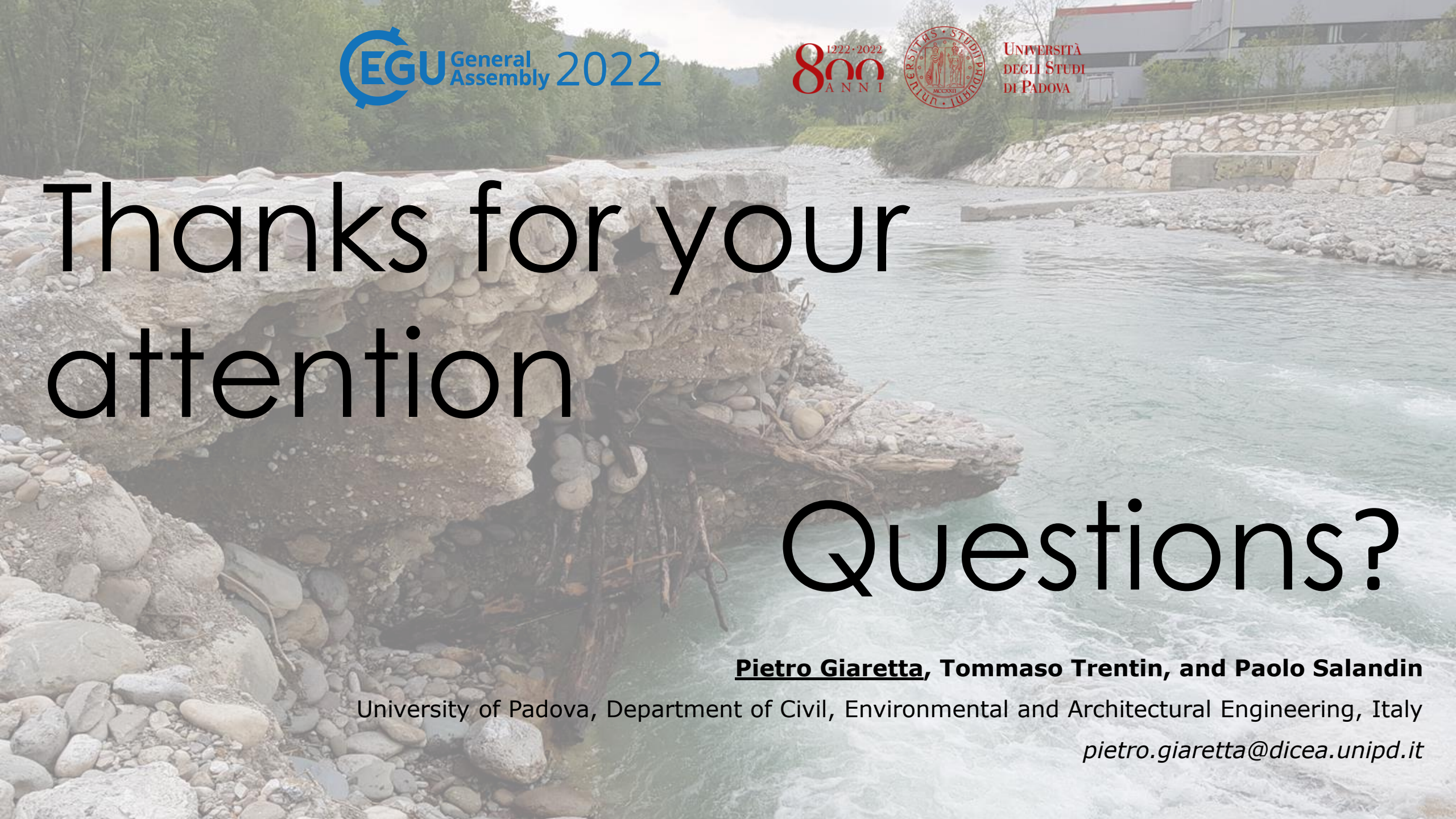
MAXIMUM SCOUR WITHOUT A PROPER RIVERBED PROTECTION

Less than one half of the maximum scour (without a proper riverbed protection)



Thanks for your attention

Questions?

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