



Power and Scour: Laboratory simulations of tsunami-induced scour

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The world's coastal regions are becoming increasingly urbanised and densely populated. Recent major tsunami events in regions such as Samoa (2007), Indonesia (2004, 2006, 2010), and Japan (2011) have starkly highlighted this effect, resulting in catastrophic loss of both life and property, with much of the damage to buildings being reported in EEFIT mission reports following each of these events.

The URBANWAVES project, led by UCL in collaboration with HR Wallingford, brings the power of the tsunami to the laboratory for the first time. The Pneumatic Tsunami Simulator is capable of simulating both idealised and real-world tsunami traces at a scale of 1:50.

Experiments undertaken in the Fast Flow Facility at HR Wallingford using square and rectangular buildings placed on a sediment bed have allowed us to measure, for the first time under laboratory conditions, the variations in the flow field around buildings produced by tsunami waves as a result of the scour process.

The results of these tests are presented, providing insight into the process of scour development under different types of tsunami, giving a glimpse into the power of tsunamis that have already occurred, and helping us to inform the designs of future buildings so that we can be better prepared to analyse and design against these failure modes in the future.

Additional supporting abstracts include Foster et al., on tsunami induced building loads; Chandler et al., on the tsunami simulation concept and McGovern et al., on the simulation of tsunami-driven scour and flow fields.