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# New techniques for environmental monitoring and risk assessment in water surface systems

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Our society is continuously impacted by significant weather events many times resulting in catastrophes that interrupt our normal way of life. In the context of climate change and increasing urbanisation these "extreme" hydrologic events are intensified both in magnitude and frequency, inducing costs of the order of billions of pounds.

The vast majority of such costs and impacts (even more to developed societies) are due to water related catastrophes such as the geomorphic action of flowing water (including scouring of critical infrastructure, bed and bank destabilisation) and flooding. New tools and radically novel concepts are in need, to enable our society becoming more resilient.

In this presentation, new research at the interface of sensors and water engineering is presented, focusing on addressing the above challenges in a holistic and comprehensive manner. In particular, the design, development, testing and calibration, as well as preliminary field implementation of a new tool for risk assessment and environmental monitoring in water surface systems, is explored in this work.

It is demonstrated that novel advances in conceptual approaches in water engineering and specifically in the field of hydrodynamic transport of solids (such as the impulse and energy criteria) can be successfully combined with rapid advances in sensors to help monitor and increase the resilience of our society against catastrophic hydrologic events.