



## **Communicating and Visualizing Erosion-associated Risks to Infrastructure**

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Soil erosion is a major problem worldwide, affecting agriculture, the natural environment and urban areas through its impact on flood risk, water quality, loss of nutrient-rich upper soil layers, eutrophication of water bodies, sedimentation of waterways and sediment-related damage to roads, buildings and infrastructure such as water, gas and electricity supply networks. This study focuses on risks to infrastructure associated with erosion and the interventions needed to reduce those risks.

Deciding on what interventions to make means understanding better which parts of the landscape are most susceptible to erosion and which measures are most effective in reducing it. Effective ways of communicating mitigation strategies to stakeholders such as farmers, land managers and policy-makers are then essential if interventions are to be implemented. Drawing on the Decision-Support Matrix (DSM) approach which combines a set of hydrological principles with Participatory Action Research (PAR), a decision-support tool for Communicating and Visualizing Erosion-Associated Risks to Infrastructure (CAVERTI) was developed. The participatory component was developed with the Wear Rivers Trust, focusing on a case-study area in the North East of England. The CAVERTI tool brings together process understanding gained from modelling with knowledge and experience of a variety of stakeholders to address directly the problem of sediment transport. Development of the tool was a collaborative venture, ensuring that the problems and solutions presented are easily recognised by practitioners and decision-makers. This recognition, and ease of access via a web-based interface, in turn help to ensure that the tools get used. The web-based tool developed helps to assess, manage and improve understanding of risk from a multi-stakeholder perspective and proposes solutions to problems.

We argue that visualization and communication tools co-developed by researchers and stakeholders are the best means of ensuring that mitigation measures are undertaken across the landscape to reduce soil erosion. The CAVERTI tool has proven to be an effective means of encouraging farmers and land owners to act to reduce erosion, providing multiple benefits from protecting local infrastructure to reducing pollution of waterways.