Geophysical Research Abstracts
Vol. 18, EGU2016-6497-1, 2016
EGU General Assembly 2016
© Author(s) 2016. CC Attribution 3.0 License.

Insightful monitoring of natural flood risk management features using a low-cost and participatory approach

Eleanor Starkey (1), Mhari Barnes (1), Paul Quinn (1), and Andy Large (2)

(1) School of Civil Engineering and Geosciences, Newcastle University, Newcastle upon Tyne, United Kingdom (eleanor.starkey@ncl.ac.uk), (2) School of Geography, Politics and Sociology, Newcastle University, Newcastle upon Tyne, United Kingdom

Pressures associated with flooding and climate change have significantly increased over recent years. Natural Flood Risk Management (NFRM) is now seen as being a more appropriate and favourable approach in some locations. At the same time, catchment managers are also encouraged to adopt a more integrated, evidence-based and bottom-up approach. This includes engaging with local communities. Although NFRM features are being more readily installed, there is still limited evidence associated with their ability to reduce flood risk and offer multiple benefits. In particular, local communities and land owners are still uncertain about what the features entail and how they will perform, which is a huge barrier affecting widespread uptake. Traditional hydrometric monitoring techniques are well established but they still struggle to successfully monitor and capture NFRM performance spatially and temporally in a visual and more meaningful way for those directly affected on the ground.

Two UK-based case studies are presented here where unique NFRM features have been carefully designed and installed in rural headwater catchments. This includes a 1km^2 sub-catchment of the Haltwhistle Burn (northern England) and a 2km^2 sub-catchment of Eddleston Water (southern Scotland). Both of these pilot sites are subject to prolonged flooding in winter and flash flooding in summer. This exacerbates sediment, debris and water quality issues downstream. Examples of NFRM features include ponds, woody debris and a log feature inspired by the children's game 'Kerplunk'. They have been tested and monitored over the 2015-2016 winter storms using low-cost techniques by both researchers and members of the community ('citizen scientists').

Results show that monitoring techniques such as regular consumer specification time-lapse cameras, photographs, videos and 'kite-cams' are suitable for long-term and low-cost monitoring of a variety of NFRM features. These techniques have been compared against traditional hydrometric monitoring equipment. It is clear that traditional techniques are expensive, require specialist skills and outputs are complicated to the untrained eye. These alternative methods tested are visually more meaningful, can be interpreted by all stakeholders and techniques can be easily utilised by citizen scientists, land owners or flood groups. Such techniques therefore offer a before, during and after NFRM monitoring solution which can be more realistically and readily implemented, supports engagement and subsequent uptake and maintenance of NFRM features on a local level. Although monitoring techniques presented are relatively simple, they are regarded as being essential given that many schemes are not monitored at all.