



Developing the ‘Multihazard Impact Assessment System’ (MImAS) for identifying infrastructure assets at greatest risk from combined hazards.

Katy Mee, Gareth Jenkins, Kathrine Linley, and Kathryn Lee

British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, NG12 5GG, United Kingdom
(katy@bgs.ac.uk)

A key challenge for infrastructure asset managers is to provide sustainable and affordable solutions, meaning that their assets must be resilient to natural hazards. As well as understanding the distribution and severity of individual hazards in relation to their assets, it is crucial to understand the interaction between multiple hazards and how their combined effects can exacerbate those impacts. Understanding these interactions means asset managers can begin to identify assets under threat and prioritise areas where mitigation is most needed. The scale of resource set aside by asset managers to respond to natural hazards is huge and yet these costs typically relate to single hazards. Contributing factors from other hazards means the impacts from cascading hazards may be immeasurably larger and, as yet, are little understood.

We are developing a ‘Multihazard Impact Assessment System’ (MImAS) to identify locations throughout the UK at greatest risk from the combined effects of multiple natural hazards. Rankings are assigned to the different hazard combinations and types of interactions (i.e. independent, cascading) using existing British Geological Survey (BGS) hazards datasets. These rankings will be integrated with asset data (e.g. power networks) in a GIS and delivered to asset managers via a ‘data dashboard’ to enable them to identify which of their assets are most at risk from combined hazards.

MImAS will help asset managers to prioritise when and where to invest in site maintenance, upgrade equipment, mitigate or consider redesign. The key benefit to asset managers is cost savings through (1) prioritisation of remedial and renewal work, (2) aiding strategic investment planning and (3) providing early warnings of potential failures. These, in turn, will contribute towards time saving by reducing the need for site visits, whilst helping to identify sites requiring closer monitoring. Once fully developed, MImAS will have a wider application to other energy and infrastructure organisations. The principles of MImAS could also be adapted to other hazards around the world and be adapted for a range of different end-users.