



A data driven approach to landslide susceptibility mapping in Great Britain

Chris Williams, Emma Bee, Claire Dashwood, and Ben Marchant
British Geological Survey, Keyworth, United Kingdom (ebee@bgs.ac.uk)

The impact of landslides, depending on their location, can be significant. Most importantly, landslides can pose serious risk to human life. Additionally, infrastructure can be affected, causing network closures or route diversions may mean severe delays to travel time affecting businesses and the local economy. Identifying areas where landslides are likely to occur can be a difficult task due to the difficulty in monitoring and assessing the various conditioning factors involved. These efforts are further hampered by uncertainty in the data available and the methods used when modelling.

In Great Britain, the national landslide database, hosted by the British Geological Survey (BGS), is regularly updated and currently contains over 17,000 records. These records contain information including location, size, type and associated damage caused. Knowledge gained from the landslide database, in addition to geology, topographic morphological indices (e.g. slope) was by the BGS, through an expert driven approach, to derive its landslide susceptibility model for Great Britain (GeoSure). GeoSure was derived in 2005 using an heuristic approach due to the lack of event data available in the landslide database at the time. Upwards of 8,000 landslide events have subsequently been added to the database, presenting an opportunity to compare and contrast the GeoSure heuristic model against purely data-driven approaches and potentially offer new insights.

This work shows preliminary thoughts and findings for a new, data driven, approach to landslide susceptibility mapping in Great Britain. This approach implements data clustering methods as well as generalised mixed linear models to analyse data independent of theoretical landslide processes to assess the ability of a purely data driven approach to predict potential landslide occurrence.