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Building and Maintaining a State-wide Landslide Planning Layer in Tasmania

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Parts of Tasmania are susceptible to a range of landslide types and it is accepted within government and the broader community that new developments need to consider this hazard at the planning and building approval stage. Tasmania's size, which is larger than Switzerland albeit less mountainous, presents a considerable challenge for a team of two geoscientists to create a state-wide spatial layer that identifies where landslide risk management reports are required or developments are restricted. Furthermore, this layer must be sufficiently reliable and predictive but not overly conservative which can be perceived as an unjustifiable impost on developments.

A series of 'hazard-band' layers have been created for a range of natural hazards in the State that are progressively being incorporated into legislated planning schemes. A landslide zonation layer was first created in 2013 by combining a range of data sources, based on the best available data principle. Data sources include a landslide database, 1:25 000 susceptibility mapping in priority areas (rock fall, debris flow and deep seated landslide), and slope thresholds for the remaining areas. A series of professional judgements were undertaken to determine the relative importance of the contributing layers in order to create a qualitative ranking of Acceptable, Low, Medium, Medium-Active and High.

The banding has various levels of uncertainty depending on the quality of the source information and methods used at any particular place. An upgrade is currently in progress to reflect the subsequent acquisition of superior input data and improved landslide knowledge. One of the most important components of this phase is upgrading the Digital Elevation Model (DEM), particularly as more than half of the state now has freely available LiDAR data. The new DEM is proving invaluable for identifying previously unknown landslides, particularly in forests, and for improving the spatial accuracy of previously mapped features. Temporal datasets such as satellite imagery and successive aerial photography is also proving useful for identifying recent shallow landslides on steep forested landscapes, some of which can be related to known rainstorm events. Finally the availability of improved modelling tools for rock fall and debris flow runout utilising the new DEM will collectively improve the reliability of the upgraded hazard banding.

The general acceptance of the banding has come about through documentation of the methods alongside open consultation, where the strengths and weaknesses of the approach are communicated. In addition, the approval process provides a pathway for geotechnical practitioners to test the reliability of the banding and confirm the position of critical boundaries on the property concerned. We encourage their reports to be supplied back to our agency to enable us to refine our models where necessary.

The banding is publicly available within a government web-mapping application site and as web services for viewing directly in GIS software. While designed primarily as a planning tool, it also acts as a form of self-regulation for identifying potential risks that may be incurred for developing or purchasing a particular site.