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Landslide volume and surface area - Analytical and observational relations

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A remarkable field observation is that landslides of different sizes, from different locations around the globe, triggered by different mechanisms, all seem to follow a single relation, with their volume to surface area ratio following a power law of approximately 1.4. An analytical examination of the shape of landslides based on limit equilibrium principles involving the exact mathematical solution of the failure mode reveals a similar exponent, and hence provides a mechanical basis to the previously poorly understood field observations. In addition, a new graphical interpretation of the factor of safety associated with slope stability analysis, and its relation to the probability of failure is presented.