



A quantitative technique for the morphological characterisation of submarine slides.

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Quantitative geomorphological investigations are rarely conducted on submarine landscapes. We adapt numerical techniques developed for subaerial geomorphological analyses to submarine environments, and provide an integrated method to extract geological information from bathymetric data. The method incorporates three main morphometric techniques: (1) geostatistical analyses (2) feature-based quantitative representation, and (3) automated topographic classification. These techniques enable the extraction of useful morphological information from a digital elevation model supporting visual geomorphological interpretation of submarine landscapes. ISODATA and geostatistical analysis provide summary information about an area, which can be used to calibrate computer-generated geomorphometric maps. These maps are the basis for the geological interpretation and can be used as basemaps also for geological results from other sources. If slope failures are identified, their identification and understanding of the underlying processes can be improved by extracting the ridge pattern and mapping ridge characteristics. Moment statistics are used as proxies of surface roughness to differentiate between different surface types. A case study of debris flow lobes in the Storegga Slide shows that the techniques work robustly, and that the new methodology significantly enhances submarine geomorphological investigations.