



## Statistical and geospatial approaches to evaluate the quality of earthquake-triggered landslide inventories

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Evaluating landslide inventories is crucial and the first step in assessing the extent of landslide event damage. Despite the several studies in landslide inventory preparation and assessment, there is a lack of standardised criteria for measuring their quality and completeness. This study aims to introduce an integrated approach for analysing different event inventories prepared by different geomorphologists. We considered five landslide inventories prepared by various authors following the 2015 Gorkha earthquake in Nepal [1-5]. We prepared susceptibility maps using multiple realisations of logistic regression, with slope units of the areas as a spatial basic unit for the analysis [6]. The goal was to analyse their differences or similarities and comprehend the influence of using them to prepare landslide susceptibility maps [7].

The key questions we explored were: How can the quality and reliability of landslide inventories be evaluated? And what are the similarities or differences in the landslide susceptibility maps generated using inventories from different research teams for the same event? To this end, we utilised three evaluation criteria: (i) an error index to check the discrepancies between inventories, (ii) statistical analysis to examine the inconsistencies in predisposing factors and susceptibility map performance, (iii) geospatial analysis to evaluate differences among inventories and their corresponding.

The study highlighted differences in landslide inventories and attributed them to differences in data collection methods and subjective judgments. It emphasised the need to address subjectivity for more accurate and consistent landslide mapping. The results from statistical analysis showed substantial differences in the areal extent and overlapping degree between inventories. The geospatial analysis, such as hot spots and cluster/outlier analysis, highlighted the distinctive differences in spatial patterns of landslide susceptibility maps corresponding to different inventories. The suggested geospatial methods offer investigators a viewpoint for quantitatively analysing earthquake-triggered landslide inventories and related susceptibility maps.

### References

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