



Spatial modelling of periglacial phenomena in Deception Island (Maritime Antarctic): logistic regression and informative value method.

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Field surveying during the austral summer of 2007/08 and the analysis of a QuickBird satellite image, resulted on the production of a detailed geomorphological map of the Irizar and Crater Lake area in Deception Island (South Shetlands, Maritime Antarctic - 1:10 000) and allowed its analysis and spatial modelling of the geomorphological phenomena.

The present study focus on the analysis of the spatial distribution and characteristics of hummocky terrains, lag surfaces and nivation hollows, complemented by GIS spatial modelling intending to identify relevant controlling geographical factors. Models of the susceptibility of occurrence of these phenomena were created using two statistical methods: logistical regression, as a multivariate method; and the informative value as a bivariate method. Success and prediction rate curves were used for model validation. The Area Under the Curve (AUC) was used to quantify the level of performance and prediction of the models and to allow the comparison between the two methods. Regarding the logistic regression method, the AUC showed a success rate of 71% for the lag surfaces, 81% for the hummocky terrains and 78% for the nivation hollows. The prediction rate was 72%, 68% and 71%, respectively. Concerning the informative value method, the success rate was 69% for the lag surfaces, 84% for the hummocky terrains and 78% for the nivation hollows, and with a correspondingly prediction of 71%, 66% and 69%.

The results were of very good quality and demonstrate the potential of the models to predict the influence of independent variables in the occurrence of the geomorphological phenomena and also the reliability of the data.

Key-words: present-day geomorphological dynamics, detailed geomorphological mapping, GIS, spatial modelling, Deception Island, Antarctic.