

Soil characteristics and pedogenesis on sub-Antarctic Marion Island

Natalie R. Lubbe¹, Ian Meiklejohn¹ and Johan van der Waals²

¹*Department of Geography, Geoinformatics & Meteorology, University of Pretoria, Pretoria, 0002, South Africa;* ²*Department of Crop Production & Soil Science, University of Pretoria, Pretoria, 0002, South Africa.*

Marion Island is a sub-Antarctic volcanic island with a cold, wet climate. Much of the interior of the island is bare, with vegetation only found at lower altitudes. No soil classification has yet been undertaken for the island, and literature on its soils and pedogenesis is sparse; it has even been suggested that true soils don't exist there¹. As part of a broader research project on Geomorphology and Climate Change the chemical, physical and mineralogical properties of soils from seven terrestrial habitats were analysed. A strong relationship was observed between soils and the habitats as described by Gremmen and Smith². Soils were classified according to the World Reference Base (WRB) soil classification system³. Preliminary findings suggest that Histosols, Andosols and Regosols dominate on Marion Island. Relationships between soil type, habitat type, and altitude were investigated and it was also found that pedogenesis has taken place. The spatial distributions of soil types for the island were predicted with the use of a GIS model and are presented, together with the implications of climate change for pedogenesis and soil distribution.

1. Gribnitz, K.H., Kent, L.E., & Dixon, R.D. Volcanic ash, soils and the inferred Quaternary climate of sub-Antarctic Marion Island. *South African Journal of Science* **82**, 629-635 (1986).
2. Gremmen, N., Smith, V. *The flora of Marion and Prince Edward Islands*, Data Analyse Ecologie, Netherlands (2004).
3. Driessen, P., Deckers, J., Spaargaren, O., Nachtergaele, F. *Lecture notes of the major soils of the world*, Food and Agriculture Organisation of the United Nations, Rome (2001).