Murdoch UNIVERSITY

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5.10
Ecology, People & Environment

The Cape Vlamingh interpretive walking trails on the west end of Rottnest Island. (Photo: Bob Gozzard)

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Evaluation of geotourism potential through geographic information systems

Geotourism aims to provide opportunities for visitors to view and experience geological and geomorphological processes in a way that generates appreciation and understanding of the environment.

In particular, geotourism is focused on providing access for the interpretation of geological features and processes (e.g. mechanisms of weathering, erosion and tectonic history) of a natural area. Geotourism aims to provide opportunities for visitors to view and experience geological and geomorphological processes in a way that generates appreciation and understanding of the environment.

GIS and remote sensing provide powerful quantitative data-sets and tools for identification of new potential geosites and the analysis of their tourism potential. Spatial data analysis can help with suitability analysis such as proximity to potential hazards or analysis of ease of access by a range of visitors (type of surface and slope conditions for walking, riding or driving). Application of GIS and its specialised tools can be used to understand complex scenarios on the allocation and evaluation of specific criteria for areas of potential tourism interest. GIS is routinely used in management planning but it is not yet comprehensively employed as an operational tool for geotourism planning and geosite product development in

many natural environments such as the geologically rich Rottnest Island in Western Australia.

Rottnest Island is located 18km from the coastline of south-west Western Australia (Figure 1). The island is a popular international and local tourism destination and attracts around 550,000 visitors annually. The Island is part of an extensive Quaternary limestone dune system of aeolian origin (aeolianite) that occurs along the south-western coastline of Western Australia.

This research employed an approach using environmental datasets, including aerial and satellite imagery, in conjunction with field site investigation for the assessment of geological sites of interest on Rottnest Island. We aimed to develop a novel approach in geotourism planning focussing on the identification of potential

sites of geological interest, using a multi-criteria evaluation (MCE) method (Figure 2). We also investigated suitable geosites (Figure 3) for the subsequent development of interpretive content for geotourism products such as, interpretive panels, pamphlets, guided tours and mobile phone applications.

We have created three different tourist profiles: easy, moderate and advanced. Easy access is through the public bus and less than 200m walk to the focal point. Moderate access is via bus or bicycle and a walk 200–500m to the geosite. Advanced access is via bus or bike and more than a 500m walk on any surface.

This study has confirmed that Rottnest Island has sites with geotourism potential and that spatial data analysis through GIS, combined with field studies, has been instrumental in helping to identify potential geosites.
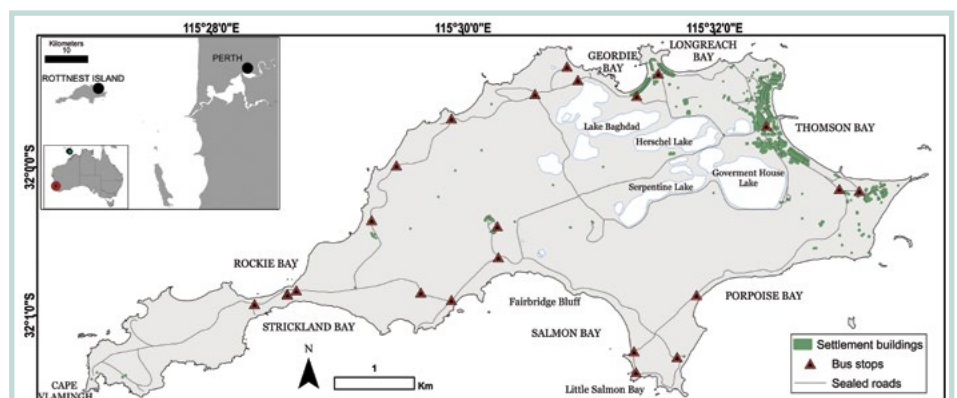

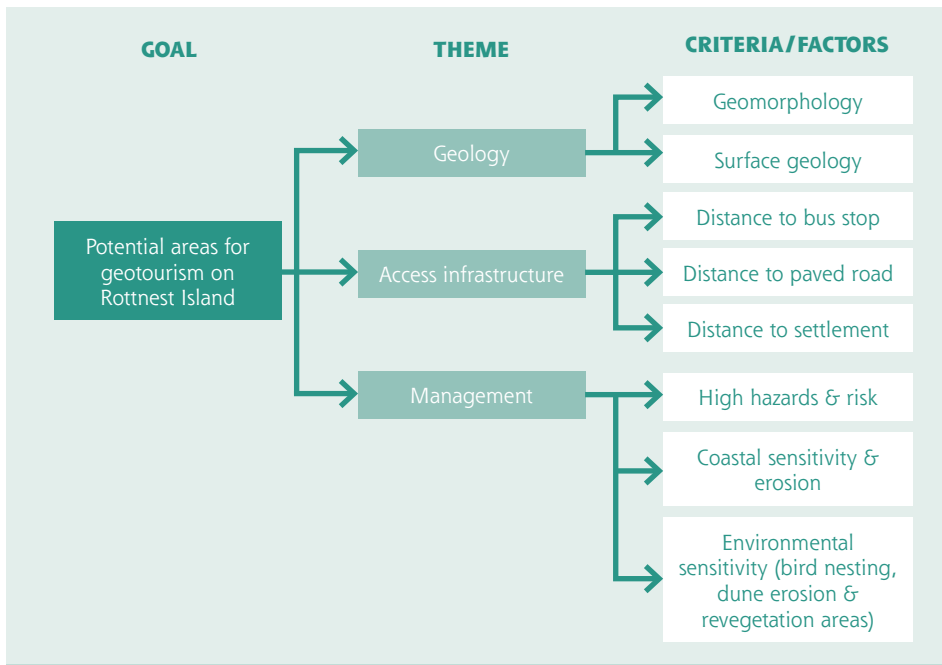**FIGURE 1** Rottnest Island study area with the network of sealed roads and settlement location

FIGURE 2 Overview of the analysis approach taken to determine sites with potential geological or geomorphological interest

FIGURE 3 Spatial location of geosites for each tourism access category, easy, moderate and advanced

In addition, this research provides a guide to potential geo-interpretative content and provides valuable data that can support geotourism product planning and site-specific information especially regarding environmental management considerations.

The results of this research generated a GIS geosite database that contains information for a number of suitable geosites for the development of geotourism on Rottnest Island. In particular, the information (e.g. evidence of sea-level change) gathered in this research can assist in the creation of geo-interpretation products (e.g. geotour guide books, oral content for educative geotours, interactive mobile phone applications, interpretative panels). There are additional opportunities for further research in developing geotourism products, which will provide scientific educative content, with the aim of generating an understanding, appreciation and awareness of the geological environment of Rottnest Island. ∎
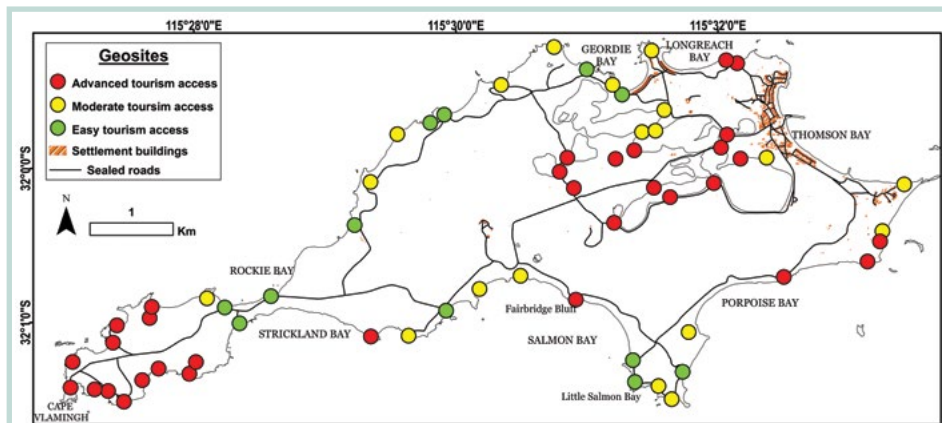
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Acknowledgements

References

1 J. Rutherford, H. Kobryn & D. Newsome , Current Issues in Tourism (2014): A case study in the evaluation of geotourism potential through geographic information systems: application in a geology-rich island tourism hotspot, Current Issues in Tourism, DOI: 10.1080/13683500.2013.873395.

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