

Geopark investigation and geoduction research initiatives: an example from the proposed Banks Peninsula geopark

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Banks Peninsula on the eastern coast of New Zealand's, South Island, is a highly eroded Miocene volcanic complex where the exposed volcanic formations offer a unique view of the inner workings of a strato-shield volcano. Lava domes, plugs, dykes, spatter cones, and other volcanic features have not only spawned a unique biodiversity, but have provided a rich environment for the settlement and prosperity of pre-historic Maori (i.e. significant archaeological sites) and subsequent early European occupation (i.e. heritage sites). As such, Banks Peninsula is currently being scoped as a future UNESCO Geopark and, here, we present our methodology for achieving Geopark status while linking closely with an undergraduate research geo-education initiative.

Initial recognition of key geosites is through collation of historical datasets, previous geological mapping and studies, archaeological and cultural sites and studies, established parks and reserves, walking tracks, tourist operations, areas of ecological significance, and areas of natural significance. Investigation of geosites is being completed as part of undergraduate student research projects initiated through Frontiers Abroad (a New Zealand based study abroad programme) and the University of Canterbury. Students are deployed in field research teams, with each team member having a defined role (i.e. GIS Mapping, Geochemistry, Explosive eruptives, Lavas and intrusives, and a UNESCO Geopark representative). Each research team is deployed in an area of known geological significance, aiming to produce high resolution geological maps, stratigraphically controlled geochemical sampling and analysis, unravelling of geological histories of prominent features (i.e. dykes, domes, scoria cones, lava sequences), recognize areas of significance (i.e. biological, archaeological, cultural), produce geo-education materials, establish frameworks for geosites/trails, and collate Geopark application materials. These projects are also part of an overall research goal to produce a high-resolution geological map, stratigraphy, and research on the volcanics of Eastern Banks Peninsula.