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HEARD ISLAND AND THE MCDONALD ISLANDS – OUTSTANDING QUESTIONS

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The Territory of Heard Island and the McDonald Islands includes two very poorly understood active volcanoes. It was inscribed on the World Heritage List largely for its geological values.

Heard Island is unusual among islands in having history extending over some 40 million years but this is poorly documented and no adequate geological map exists. Detailed mapping of the Drygalski Formation is necessary, including facies variation and resolving the issue of a glacial component.

The age of the modern volcano of Big Ben, possibly less than one million years, should be determined to help establish the rate of extrusion of lava and change with time, for comparison with 'normal' oceanic volcanoes.

Heard Island has suffered a major debris avalanche, and the small Mt Mawson formed inside the scar, but the timing of the avalanche is unclear, as is the likelihood of any such avalanches in the foreseeable future.

McDonald Island renewed eruption in December 1992 after some 75-100 000 years, and has continued, changing the island dramatically, generating new landforms and beaches for increasing wildlife. The lava is phonolite (high sodium/high potassium/low silica) contrasting markedly with that on Heard Island. McDonald Island lies at the southeastern end of a linear series of four evenly-spaced seamounts suggesting it is the active end of an unusual hotspot trace, as Kerguelen Plateau is virtually stationary. Recently, dredge samples have been obtained from two of the other three seamounts and study has thus commenced on three of the four seamounts.

The project will benefit from modern remote sensing imagery as advances now allow detection of objects as small as 0.6m. Additionally, the increase in spectral resolution of multi-spectral and hyper-spectral sensors has made it possible to derive information on the physical composition of the surface.