

1979/5. Magnetic survey at Shoal Bay, Maria Island.

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*Abstract*

Regional mapping of the presumed faulted boundary between Jurassic dolerite and Lower Palaeozoic rocks on Maria Island indicates a significant dextral offset in Shoal Bay. A magnetic survey in Shoal Bay indicates that the boundary is offset immediately north of Point Maugé on the southern side of Shoal Bay.

INTRODUCTION

The onshore location of the dolerite - Lower Palaeozoic boundary based on the regional mapping of M.J. Clarke is shown in Figure 1. In each part of Maria Island this boundary has an approximately north - south trend but an offset of about 1 km or a trend change is implied in Shoal Bay. As the Lower Palaeozoic sedimentary rocks or granite are normally less magnetic than the adjacent Jurassic dolerite, a marine magnetic survey was considered the simplest means of locating the boundary across the bay.

SURVEY RESULTS

A McPhar M700 Fluxgate magnetometer (sensitivity 10 nT) was used and several traverses were run in Oyster and Shoal Bays south and east of Point Lesueur and north-east of Point Maugé. Unfortunately sea conditions did not permit full realisation of the desired precision and line continuity, but profiles are generally reliable to within 100 nT. The survey was attempted on successive days with winds from the north-east, south-west and north respectively and wave problems were encountered in each case, as Shoal Bay is both large and exposed.

Anomalies related to dolerite ranged from -500 to +800 nT at the scale setting used. All values are relative. Dolerite-related anomalies also show extreme and rapid variations. No regions of smooth anomalies were noted. Anomalies of the above type may be contrasted with those recorded over much of the bay where broad smooth anomalies in the range +650 to +1100 nT were observed. The normal values recorded were +650 to +750 nT. The junction between the two types of anomaly can be recognised in most cases by a narrow zone of negative values which strongly contrasts with the background pattern produced by the granite - Palaeozoic sedimentary basement materials.

Figure 1 indicates traverse intersections of the magnetic profile character described above and interpreted as related to the faulted boundary of the dolerite. The boundary extends southward from north Maria Island close inshore and may be traced to near Point Maugé on south Maria Island. Incidental traverses south-east of Point Lesueur located a similar boundary but with a north-west - south-east trend. Such a trend locally parallels the coast. The situation off south Maria Island is not well defined. The boundary appears to have an abrupt offset less than 400 m offshore at the western end of the spit and then passes close inshore to intersect the boundary from the north of Point Maugé. The position and orientation of the boundary is not well defined due to navigation problems, there being insufficient distinctive reference points locally. However the trend of the boundary is certainly north of west, possibly north-west. No evidence of dolerite could be found north or east of the limit lines shown on Figure 1. A number of traverses were made around Point Maugé and the probable position indicated is based on those intersections recorded when control was best.

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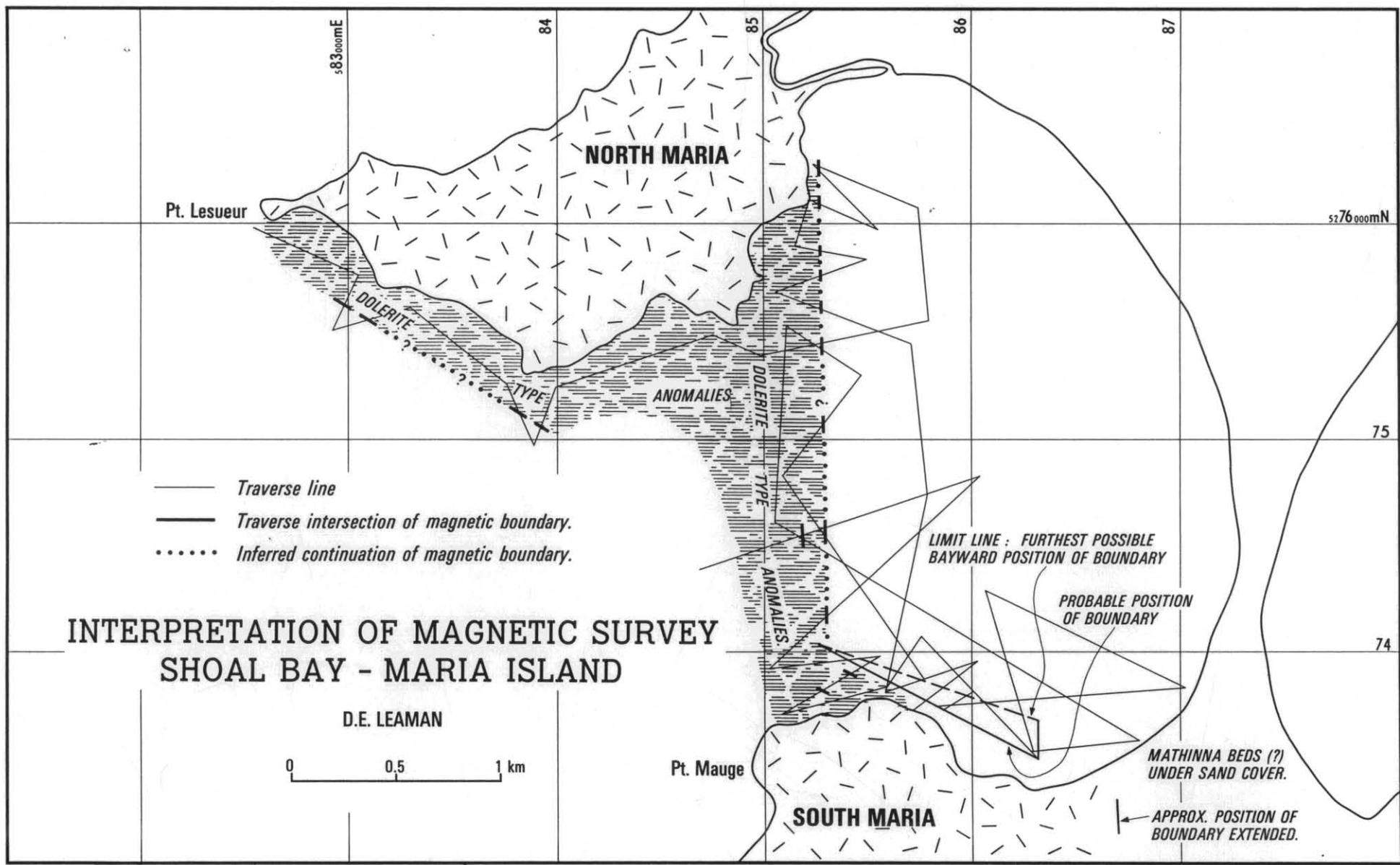


Figure 1.

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