

Australian Geological Survey Organisation (AGSO): Programs of relevance to Tasmania

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AGSO's programs of relevance to Tasmania include National Geoscience Mapping Accord (NGMA) activities, and geophysical observatory work undertaken to fulfil AGSO's national and international commitments to earthquake seismology and hazard assessment, and geomagnetic field studies.

THE NATIONAL GEOSCIENCE MAPPING ACCORD

Compared to the mainland States and the Northern Territory, Tasmania is geologically well mapped. The Tasmanian Government has consistently supported geological mapping by the Tasmania Department of Mines to the extent that expenditure on mapping in the State is higher than for any other State/Territory on the basis of expenditure per square kilometre.

As a result of this commitment to geoscience, Tasmania is completely mapped at a scale of 1:250 000 to a quality comparable to, or better than, the 1:250 000 map coverage of the mainland. More importantly, however, it is approximately 60% mapped at a scale of 1:50 000 or, in some cases, 1:63 360, and the metallogenically important Mt Read Volcanic belt has been approximately 80% mapped at a scale of 1:25 000 as part of a joint State/Commonwealth funded program.

Because of the present status of Tasmania's geological mapping, AGSO's Tasmanian contribution to the NGMA is different to that for the mainland, where there has been a heavy emphasis on field-based studies underpinned by new-generation airborne geophysical data flown at the NGMA line-spacing standard of 400 metres. In Tasmania AGSO is presently undertaking specialist geochronology studies using the SHRIMP ion microprobe in preparation for a deep seismic profile survey schedule for 1994-1995. The study will involve three transects. The longest and most important lies close to the northern coast of Tasmania. It will cross all major Tasmanian geological structures almost at right angles and should provide a clear picture of the gross structure of northern Tasmania including, in particular, the behaviour at depth of structures such as the Arthur Lineament and the Tamar Lineament. The second line will cross the Dundas Trough in the west of the State, while the third will stretch from the central highlands to the east coast.

From a national geoscience perspective AGSO is also concerned with the special importance of Tasmania as an

island State, and with the geological relationships between Tasmania and the mainland. To help refine understanding of these relationships, AGSO is presently co-operating with Tasmania, South Australia and Victoria to digitise an early analogue airborne geophysical survey of Bass Strait and the offshore Otway Basin to provide digital coverage of these important offshore areas. The results will be incorporated into AGSO's digital magnetic map of Australia, and will be available towards the end of 1992.

In the field of gravimetry, Tasmania has made a major effort to improve the coverage of the State, and AGSO assisted the work earlier this year by sending a field party to Tasmania to repair and replace, where necessary, the gravity base stations. There are now 20 well-calibrated gravity stations in Tasmania. These are available for tying in new detailed surveys and also linking the Tasmanian gravity observations to the national and global networks.

GEOPHYSICAL OBSERVATORIES PROGRAM

AGSO has a substantial investment in geophysical observatories, both in Australia and Antarctica. Tasmania is particularly important as far as earthquake risk is concerned, as parts of the State have experienced several damaging earthquakes during the last 100 years.

The then Bureau of Mineral Resources became involved with the Tasmanian network in January 1974, when it agreed to provide support to the University of Tasmania to operate the network.

In the context of AGSO's objective of providing accurate assessment of earthquake risk we need to be able to locate all earthquakes with magnitude 3 or greater that take place throughout the Australian continent. As far as Tasmania is concerned this means that at least three stations are required on the island: the World Wide Standard Station in Hobart and two other stations. At present eight stations are operating in Tasmania, and AGSO currently contributes around \$30,000 per annum to help maintain the network.

In the geomagnetism program there is no permanent observatory in Tasmania, but the first-order stations near Hobart and at Flinders Island provide critical information every five years to help put together the Australian Geomagnetic Reference Field. Once again the location of Tasmania provides a unique opportunity for key measurements of the geomagnetic field on this part of the Earth.