PUBLS. INST. GEOPHYS. POL. ACAD. SC., C-99 (398), 2007

Replacement of Gnangara (GNA) with a New Observatory at Gingin

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A b s t r a c t

Geoscience Australia currently operates 9 geomagnetic observatories on the Australian continent, islands, and the Australian Antarctic Territory. One of these, Gnangara Observatory, is located in the south-west of the Australian continent, on the outskirts of the city of Perth. Along with the recent urban encroachment there have been numerous break-ins, incidents of vandalism, and theft of equipment, often leading to significant data losses and expenses. For these security reasons only, a phased replacement of the Gnangara Observatory by a new observatory at Gingin, 52 km north of Gnangara, is being planned.

1. History of Geomagnetic Observations in South-West Australia

Regular monitoring of the geomagnetic field in the south-west of Australia began when the Carnegie Institution of Washington established an observatory at Watheroo, 162 km north of Gnangara, in 1919. Watheroo was transferred to the Australian Government in 1947. In 1957, the government opened Gnangara, closer to the city of Perth, and after a transition period Watheroo was closed in 1959 (see Figs. 1 and 2).

2. Plans for a New Observatory

Security issues at Gnangara have prompted the search for a site for a new observatory. In recent years, negotiations with the University of Western Australia and the Western Australian Government Department of Conservation and Land Management have been underway to secure a small area of land next to the Australian International Gravity Observatory at Gingin – between Watheroo and Gnangara (116 km south of Watheroo and 52 km north of Gnangara).

Gingin Observatory will comprise

- an Absolute Building containing a single observing pier,
- a buried T-shaped variometer bunker (1 m interior height) capable of housing dual vector variometers with a separation of 7 m, and a scalar variometer,
- an external tripod-observing station,
- and an azimuth pillar.

The building material will be reconstituted limestone. The area is sandy with very low magnetic gradients. The observatory will be networked through the University of Western Australia, and 1-second data will be available in near-real-time as are other Australian observatory data.

Gingin will be instrumented with a Danish Meteorological Institute (DMI) FGE fluxgate-vector-magnetometer and a GEM GSM90 scalar variometer. Absolute instruments will be a DMI fluxgate/Zeiss 020B theodolite magnetometer and a GEM GSM90 scalar magnetometer.

Gnangara will be closed after an overlapping transition period with Gingin.

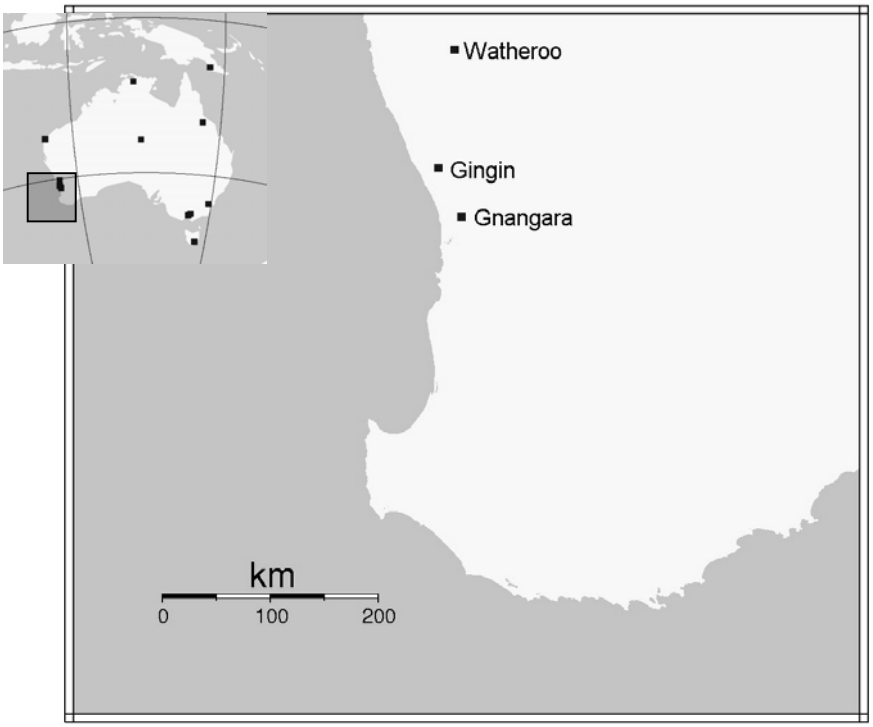

Fig. 1. Location of past, present, and future observatories in south-west Australia.

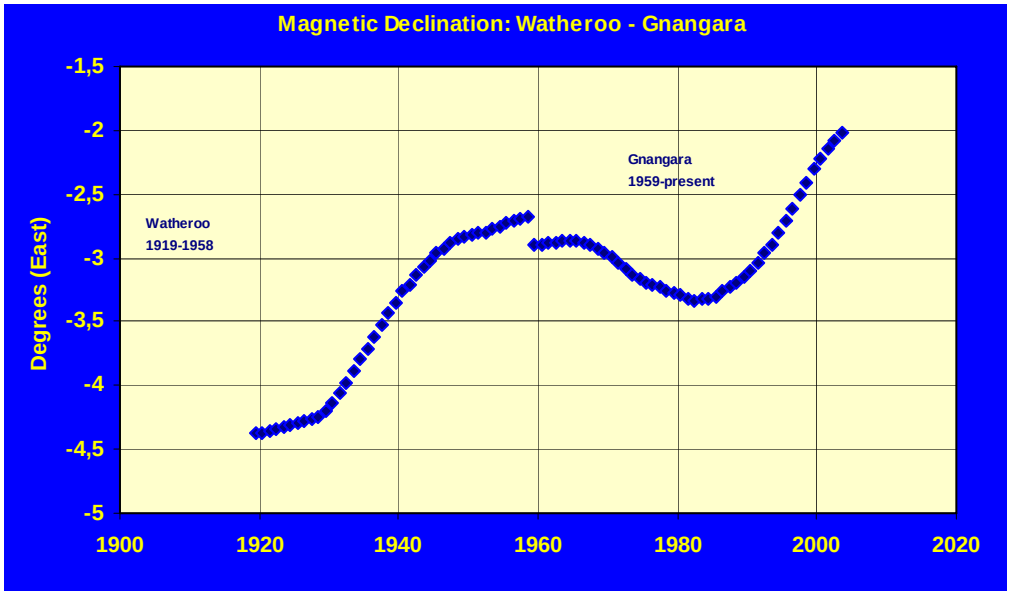

Fig. 2. Declination time-series from south-west Australia.

Accepted February 15, 2007