

ANTARCTIC DIGITAL MAGNETIC ANOMALY (ADMAP)

Executive Summary

The third workshop of the Antarctic Digital Magnetic Anomaly Project (ADMAP III) involved 2 sessions at the Spring'99 meeting of the American Geophysical Union in Boston, Massachusetts, that were followed by a meeting of the SCAR/IAGA Working Group at the Byrd Polar Research Center of The Ohio State University in Columbus, Ohio.

1) The AGU sessions entitled MAGNETIC ANOMALIES OF THE ANTARCTIC I & II were held on 3 Jun. 99. They included 21 papers contributed by 42 scientists from 10 countries with magnetic programs in the Antarctic. These sessions highlighted the efforts of the international community to acquire, archive, and use shipborne, airborne, and satellite magnetic anomaly data for Antarctic geological studies. In addition, the development and use of an improved geomagnetic reference field, as well as complementary gravity and rock magnetic property databases, were considered for enhancing geologic analyses of south polar magnetic anomalies. Geomagnetic studies of the Weddell Sea, Antarctic Peninsula, Bransfield Strait region, West and East Antarctica, Queen Maud Land, Davis Sea, and southern Indian Ocean were also reported.

2) At BPRC some 20 scientists met over 5-6 Jun. 99 to consider progress on the development of a digital magnetic database for the production of an Antarctic magnetic anomaly map. Much has been accomplished on this project in the almost 2 years since the ADMAP II meeting in Rome, Italy, including:

A) for the Weddell Sea sector (225° -15°)E, the completion of a 5-km grid of the available near-surface magnetic survey data. By 2001, the related survey line data will also be available.

B) for the East Antarctic sector (15° -135°)E, the completion of a 5-km grid of the available near-surface magnetic survey. By 2001, the related survey line data will also be available.

C) for the Ross Sea sector (135° -255°)E, the completion of 5-km grids of most of the

available near-surface magnetic survey data. By 2001, the rest of the survey data will be gridded and available along with the related survey line data.

D) for the satellite magnetic data, the development of procedures to estimate lithospheric anomalies at near-surface altitudes for merging and supplementing the airborne, marine, and terrestrial magnetic survey data. By 2000, reference lithospheric anomaly fields based on data from the POGO, Magsat, and Ørsted/Sunsat satellite missions will be available.

E) from the Mapping Advisory Subcommittee, the development of detailed recommendations for grid preparation and merging standards, as well as formats for archiving the survey line data. The three regional sector compilations will be completed in accordance with these recommendations, which are also consistent with the format requirements for submitting digital data to the World Data Center.

F) from the Geomagnetic Reference Field Subcommittee, the development of an improved south polar core field model for the period since 1960 based on Antarctic observatory and repeat-station data. Satellite magnetic observations will be incorporated into this model by 2001.

G) from the Rock Physical Properties Compilation Subcommittee, the development of a proposal for archiving by 2002 the magnetic properties for about 10,000 Antarctic rock samples.

H) from the Gravity Data Compilation Subcommittee, the implementation of a proposal for archiving by 2002 the near-surface gravity observations of the Antarctic. Significant new data on the Antarctic gravity field will result from the pending CHAMP, GRACE, and GOCE satellite gravity missions.

I) the publication of 17 peer-reviewed papers from ADMAP II in *Annali di Geofisica* (v. 42, 1999).

3) Additional activities planned for the Working Group through 2002 include:

A) documenting the AGU'99 presentations for peer review and publication in a special issue of a scientific journal.

B) presenting preliminary versions of the Antarctic magnetic anomaly map at the July'00 meeting of SCAR in Tokyo, Japan, and the July'01 meeting of IAGA in Hanoi, Vietnam.

C) completing the final compilation of the Antarctic magnetic anomaly map and digital database for the fourth meeting (ADMAP IV) of the Working Group in September'01 at the British Antarctic Survey in Cambridge, United Kingdom.

D) showcasing the final compilation and its geological applications at the Spring'02 meeting of the AGU in Boston, Massachusetts.

E) publishing a volume of peer-reviewed articles that commemorates the production and geological uses of the Antarctic magnetic anomaly map and digital database.