

Final project report

<i>Project ID</i>	2002/4.08
<i>Title</i>	<i>MAGMAP: Serie Cartografica Geomagnetica del Continente Antartico (Geomagnetic Map Series of Antarctica)</i>
<i>Principal investigator</i>	<i>Merlanti Fulvio</i>
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<i>Duration</i>	<i>2002-03 years</i>
<i>Assigned funding</i>	<i>25000,00 Euro</i>

Activities and results

Aeromagnetic anomaly mapping is a strategic tool for geological exploration of Antarctica first because of ice cover which often makes geologic fieldwork patchy. Also it can lead to improved interpretation of several geologic issues since it may offer a broader geodynamic perspective.

Within the framework of the Italian Scientific Program in Antarctica, an Antarctic Geomagnetic 1:250,000 Map Series was initiated in 1995 over Victoria Land and Marie Byrd Land. The magnetic anomalies for the Victoria Land Maps were overlain over the USGS topographic sheets.

The new MAGMAP project aims at compiling a novel set of aeromagnetic anomaly maps and relative digital databases using data collected over Victoria Land and George V Land in 1999-2001. New maps were compiled using data acquired during the GANOVEX VIII-BACKTAM campaign.

The aeromagnetic data were integrated by knitting procedures in a compilation format for the International ADMAP project.

The geological and geophysical interpretation work of these maps furnished the scientific products in terms of national and international papers reported in this final report.

Products

A – papers in scientific magazines

1. Damaske, D., E. Bozzo, D. Moeller, F. Ferraccioli and M. Chiappini, A new aeromagnetic survey along the Pennell, Oates and George V Coast (East Antarctica), in: *Ganovex VIII – ItaliAntartide XV Antarctic expedition 1999-2000*, edited by E. Bozzo and D. Damaske, *Terra Antartica Reports* No. 5, pp. 1-11, 2001.
2. Chiappini, M., Ferraccioli, F., Bozzo, E., Damaske, D., Regional compilation and analysis of aeromagnetic anomalies for the Transantarctic Mountains-Ross Sea sector of the Antarctic. *Tectonophysics*, 347, 121-137, 2002.
3. Ferraccioli, F., Bozzo E., and G. Capponi, 2002. Aeromagnetic and gravity anomaly constraints for an early Paleozoic subduction system of Victoria Land, Antarctica. *Geophysical Research Letters*, 29, 10.1029/2001GL014138.
4. Ferraccioli, F., E. Bozzo, and E. Armadillo, A high-resolution aeromagnetic field test in Friuli: towards developing remote location of buried ferro-metallic bodies. *Annali di Geofisica*, , 45, 219-232, 2002.

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5. Ferraccioli, F., E. Bozzo, D., Damaske, Aeromagnetic signatures over western Marie Byrd Land provide insight into magmatic arc basement, mafic magmatism and structure of the eastern Ross Sea Rift flank, *Tectonophysics*, 347, 139-165. 2002.
6. Bozzo, E., Ferraccioli F., Damaske D., 2003. Aeromagnetic exploration between Yule Bay and Mertz Glacier within the BACKTAM geophysical project, *Terra Antartica Rep.*, 9, 137-138.
7. Caneva G., Ferraccioli F., Armadillo E., Bozzo E., Armienti P., 2003. An aeromagnetic survey and a gravity/GDS transect over the Admiralty Mountains region: field activities, *Terra Antartica Rep.*, 9, 137-138.
8. Ferraccioli F., Damaske D., Bozzo E. & Talarico F., 2003. The Matusevich aeromagnetic anomaly over Oates Land, East Antarctica. *Terra Antartica* 10(3), 221-228.
9. Ferraccioli, F. and Bozzo E., 2003. Cenozoic strike-slip faulting from the eastern margin of the Wilkes Subglacial Basin to the western margin of the Ross Sea Rift: an aeromagnetic connection. *Intraplate Strike-Slip Deformation Belts* (Storti, F., Holdsworth R.E., & Salvini F., eds). Geological Society, London, Special Publications, 210, 109-133.

B – book chapters

1. Bozzo, E., Ferraccioli, F., Spano, M., Chiappini, M., Damaske, D., Behrendt, J., Recent progress towards the compilation of an integrated magnetic anomaly map of the Ross Sea sector of Antarctica, *In: Gamble J.A., D.N.B. Skinner, S. Henrys ed. Antarctica at the close of a millennium. Royal Society of New Zealand Bulletin*, 35, SIR publishing, pp. 629-634, 2002.
2. Bozzo, E., Ferraccioli, F., Spano, M., Chiappini, M., Damaske, D., Behrendt, J., Recent progress towards the compilation of an integrated magnetic anomaly map of the Ross Sea sector of Antarctica, *In: Gamble J.A., D.N.B. Skinner, S. Henrys ed. Antarctica at the close of a millennium. Royal Society of New Zealand Bulletin*, 35, SIR publishing, pp. 629-634, 2002.
3. Ferraccioli F., E. Bozzo, and D. Damaske, Magnetic anomalies over the King Edward VII Peninsula crustal blocks, Marie Byrd Land (West Antarctica), *In: Gamble J.A., D.N.B. Skinner, S. Henrys ed. Antarctica at the close of a millennium. Royal Society of New Zealand Bulletin* 35, SIR publishing, pp. 533-538, 2002
4. Ferraccioli F., E. Bozzo, and D. Damaske, Magnetic anomalies over the King Edward VII Peninsula crustal blocks, Marie Byrd Land (West Antarctica), *In: Gamble J.A., D.N.B. Skinner, S. Henrys ed. Antarctica at the close of a millennium. Royal Society of New Zealand Bulletin* 35, SIR publishing, pp. 533-538, 2002
5. Damaske D., E. Bozzo, G. Caneva, M. Chiappini, A. Colla, F. Ferraccioli, A. Meloni, and H.D. Möller, Total field magnetic anomaly map 1: 250,000 of Marie Byrd Land (Edward VII Peninsula/Sulzberger Bay area) Antarctica., *In: Gamble J.A., D.N.B. Skinner, S. Henrys ed. Antarctica at the close of a millennium. Royal Society of New Zealand Bulletin*, 35, SIR publishing, pp. 635-637, 2002.
6. Armadillo E., Bozzo E., A. Bonaccorso, G. Caneva, A. Capra, P. Falzone, F. Ferraccioli, F. Mancini, E. Privitera, L. Vittuari, Geophysical features of the Mt. Melbourne area and first results from the integrated network for monitoring the volcano (Antarctica), *In: Gamble J.A., D.N.B. Skinner, S. Henrys ed. Antarctica at the close of a millennium. Royal Society of New Zealand Bulletin*, 35, SIR publishing, pp. 571-578. 2002.
7. Bozzo E., F. Ferraccioli, M. Gambetta, G. Caneva, M. Chiappini, and D. Damaske, Total magnetic anomaly map 1:250,000 over northern Victoria Land between central Rennick Glacier and Evans Névé (Antarctica), *In: Gamble J.A., D.N.B. Skinner, S. Henrys ed. Antarctica at the close of a millennium. Royal Society of New Zealand Bulletin*, 35, SIR publishing, pp. 625-627, 2002.

C - proceedings of international conferences

1. Ferraccioli F., & Bozzo E., 2002. Does Cenozoic strike-slip faulting of the Transantarctic Mountains/Ross Sea rift region extend to the eastern margin of the Wilkes Subglacial Basin?. Workshop Scienze della Terra in Antartide, Certosa di Pontignano (Siena), 30 Sept.-2 Ott 2002, 59-60.
2. Ferraccioli F., Capponi G., & Bozzo E., 2002. Revisiting tectonic models for an Early Paleozoic Subduction system from a potential field perspective over Victoria Land, Antarctica. Workshop Scienze della Terra in Antartide, Certosa di Pontignano (Siena), 30 Sept.-2 Ott 2002, 61-62.
3. Caneva, G., Ferraccioli F., Armadillo E., Bozzo E., Armienti P., 2002. An aeromagnetic survey and a gravity/GDS transect over the Admiralty Mountains region: field activities. Workshop Scienze della Terra in Antartide, Certosa di Pontignano (Siena), 30 Sept.-2 Ott 2002, 27-28.
4. Coren, F., Bozzo E., Frezzotti M., Ferraccioli F., Sterzai P., Gandolfi S., & Zanolla C., 2002. Gravity and magnetic investigations across the Wilkes Basin: results of the ITASE Geophysical traverses, Workshop Scienze della Terra in Antartide, Certosa di Pontignano (Siena), 30 Sept.-2 Ott 2002, 31-32.
5. Bozzo, E., Ferraccioli F., & Damaske, D., 2002. Aeromagnetic exploration between Yule Bay and Mertz Glacier within the BACKTAM geophysical project. Workshop Scienze della Terra in Antartide, Certosa di Pontignano (Siena), 30 Sept.-2 Ott 2002, 17-18.
6. Armadillo, E., Bozzo E., G. Caneva, F. Ferraccioli, G. Tabellario, & S. Urbini, 2003. Draped aeromagnetic survey over Mt. Melbourne volcano. ISAES IX, Potsdam, Germany, 8-9.
7. Bozzo, E., D. Damaske, F. Ferraccioli, 2003. Aeromagnetic anomaly exploration between Yule Bay and Mertz Glacier (East Antarctica). IUGG 2003, Sapporo, Japan, GAV.06/09P/D011, B.257.
8. Bozzo, E., F. Ferraccioli, E. Armadillo, G. Caneva, P. Armienti, & S. Rocchi, 2003. An aeromagnetic hunt for Cenozoic alkaline intrusions north of Mariner Glacier, Victoria Land, Antarctica. ISAES IX, Potsdam, Germany,

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9. Damaske, D., E. Bozzo, F. Ferraccioli, 2003. Aeromagnetic anomaly investigation over East Antarctica from northern Victoria Land to George V Land, ISAES IX, Potsdam, Germany, 63-64.
 10. Damaske D., Ferraccioli F., & Bozzo E., 2003. Aeromagnetic anomaly investigations along the Antarctic coast between Yule Bay and Mertz Glacier. *Terra Antarctica* 10(3), 85-96.
 11. Damaske D., Ferraccioli F., Bozzo E., 2003. Aeromagnetic anomalies between Yule Bay and Mertz Glacier (East Antarctica). EGS-AGU-EUG Joint Assembly Nice, France, April 2003, *Geophysical Research Abstracts* Vol 5.
 12. Damaske D., Ferraccioli F., Bozzo E., Chiappini M., 2003. Images of aeromagnetic anomalies over Edward VII Peninsula, northwestern Marie Byrd Land, Antarctica, *Geol. Jahrbuch* B95, 79-100.
 13. Damaske, D., H.D. Moeller, E. Bozzo, F. Ferraccioli, M. Chiappini, 2003. GANOVEX VIII: an aeromagnetic survey along the Antarctic coast between Commonwealth Bay and Cape Adare. IUGG 2003, Sapporo, Japan, GAV.06/09P/D012, B.257.
 14. Ferraccioli F. & Bozzo E., 2003. Does Cenozoic strike-slip faulting of the Transantarctic Mountains/Ross Sea Rift region extend to the eastern margin of the Wilkes Subglacial Basin, *Terra Antarctica* Rep. 9, 9-10.
 15. Ferraccioli F., Bozzo E., 2003. Aeromagnetic connection between the Wilkes Subglacial Basin, the Transantarctic Mountains and the Ross Sea Rift (Antarctica). EGS-AGU-EUG Joint Assembly Nice, France, April 2003, *Geophysical Research Abstracts* Vol 5.
 16. Ferraccioli F., Capponi G., Bozzo E., 2003. Imprints of Early Paleozoic subduction along the paleo-Pacific margin of Gondwana from aeromagnetism and gravity, Victoria Land (Antarctica). EGS-AGU-EUG Joint Assembly Nice, France, April 2003, *Geophysical Research Abstracts* Vol 5.
 17. Ferraccioli F., D. Damaske, E. Bozzo, F. Talarico, 2003. Aeromagnetic imprints of accreted(?) arc crust in the western Wilson Terrane (East Antarctica), *Terrane Processes at the Pacific Margin of Gondwana*, Cambridge, UK, 30.
 18. Ferraccioli F., G. Capponi, & Bozzo E., 2003. Revisiting tectonic models for an Early Paleozoic subduction system from a potential field perspective over Victoria Land, *Terra Antarctica* Rep. 9, 143-144.
 19. Ferraccioli, F., E. Armadillo, G. Tabellario, E. Bozzo, N. Agostinetti, D. Damaske, & G. Reitmayr, 2003. Geophysical modelling across the Rennick Graben structure, northern Victoria Land, ISAES IX, Potsdam, Germany, 88-89-90.
 20. Ferraccioli, F., & E. Bozzo, 2003. Is there a link between Cenozoic strike-slip faulting of the Transantarctic Mountains/Ross Sea Rift and the eastern margin of the Wilkes Subglacial Basin?. ISAES IX, Potsdam, Germany, 90-91.
 21. Ferraccioli, F., D. Damaske, E. Bozzo, F. Talarico, 2003. Aeromagnetic evidence for accreted(?) arc crust in the western Wilson Terrane, ISAES IX, Potsdam, Germany, 87-88.
 22. Ferraccioli, F., E. Bozzo, E. Armadillo, D. Damaske, G. Reitmayr, N. Agostinetti, G. Tabellario, 2003. Crustal modelling across the Rennick Glacier area (East Antarctica). IUGG 2003, Sapporo, Japan, JSA07/10P/A05-07, B.29.
 23. Armadillo R., E. Bozzo, G. Caneva, G. Tabellario. GDS investigations from the Rennick Graben to the western side of the Wilkes subglacial basin, Antarctica. EGS Joint Assembly Nice, France, April 2004.

D – proceedings of national meetings and conferences

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E – thematic maps

1. Ministero dell'Università e della Ricerca Scientifica e Tecnologica Programma Nazionale di Ricerca in Antartide. Antarctic Geomagnetic 1: 250 000 Map Series. Total Magnetic Anomaly Map of Northern Victoria Land between Central Rennick Glacier and Evans Névé. GITARA (GERMAN-ITALIAN AEROMAGNETIC RESEARCH IN ANTARCTICA 5, 1996-97. E. BOZZO & D. DAMASKE Coord.GITARA GROUP) BOZZO E., CANEVA G., CHIAPPINI M., DAMASKE D., FERRACCIOLI F., GAMBETTA M. (2002)
2. Ministero dell'Università e della Ricerca Scientifica e Tecnologica Programma Nazionale di Ricerca in Antartide. Antarctic Geomagnetic 1: 250 000 Map Series. Total Field Magnetic Anomaly Map Of The Lillie Glacier Area (Northern Victoria LAND) GITARA (GERMAN-ITALIAN AEROMAGNETIC RESEARCH IN ANTARCTICA 5, 1999-2000. E. BOZZO & D. DAMASKE Coord.GITARA GROUP) BOZZO E., CANEVA G., CHIAPPINI M., DAMASKE D., FERRACCIOLI F., GAMBETTA M. (2003)

F – patents, prototypes and data bases

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G – exhibits, organization of conferences, editing and similar

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H - formation (PhD thesis, research fellowships, etc.)

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Research units

RESEARCH UNIT : (Title) "Antarctic Magnetic Mapping"

COMPONENTS:

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Date: December 2003

Notes