

AEROMAGNETIC SURVEY

This is a continuation of the report of aeromagnetic surveys by the Hydrographic and Oceanographic Department. The results of ten surveys, Kita-Fukutokutai, Yokoatejima, Satsuma-Iojima, Fukutoku-Okanoba, Izu-Oshima, Io-Torishima, Ioto, Miyakejima, Izu-Oshima, and Kuchinoerabujima carried out in 2003 and 2008 are presented in this report.

Key word: aeromagnetic survey.

1. Survey

The aircraft used for the survey was YS-11 which had been remodeled so that its flying range be extended and that magnetic survey be carried out on board. The aircraft was equipped with a tail-stinger of non-magnetic plastics of 1.5 meters long at the rear of the fuselage. The instruments used for the survey are a proton magnetometer and GPS receiver.

The proton magnetometer measured geomagnetic total intensity once per two seconds with an accuracy of ± 1 nano-tesla.

2. Data processing and results

The measured total intensity include components of external field variation. The correction of the external field variation was carried out based on the continuous magnetic observations at a reference magnetic observatory close to the survey area.

For calculations of magnetic anomaly, the IGRF2000 and IGRF2005 was used as the core field model in accordance with the recommendation of the IAGA.

The details on the compiled aeromagnetic surveys are listed in Table 1.

Fig. 1~10 show the magnetic anomaly of the total intensity.

Reduction and compilation of this report have been made by S.Kato and K.Koyama belong to Geodesy and Geophysics Office.

Reference

Data Report of Hydrographic Observations, Series of Astronomy and Geodesy, No.31, 1997,
Data Report of Hydrographic Observations, Series of Astronomy and Geodesy, No.32, 1998,
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Table 1. Details on the compiled aeromagnetic surveys

Cruise index	03KIF	04YO
Area	Kita-Fukutokutai	Yokoatejima
Period	Mar. 11 2003	Nov. 11 2004
Aircraft	YS-11	YS-11
Flight Altitude	1,000 feet	2,200 feet
Magnetometer	M-123	M-123
Positioning	GPS	GPS
Track lines	1 naut. Mile N-S and E-W	0.5~1 naut. Mile N-S and E-W
Anomaly map	Fig. 1	Fig. 2
Scale of original map	1/50,000	1/50,000
Map projection	TM	TM
Reference Magnetic Observatory	Hachijo (33°04.'6 N, 139°49.'3 E)	Kanoya (31°25.'2 N, 130°52.'9 E)
Reference value for an External field correction	45,208nT	45,215nT
Core field model	IGRF2000	IGRF2000
Contour interval	50nT	25nT
Epoch year	2003.1	2004.10

Cruise index	05SA	06FU
Area	Satsuma-Iojima	Fukutoku-Okanoba
Period	Nov. 7 2005	Mar. 15 2006
Aircraft	YS-11	YS-11
Flight Altitude	4,600 feet	1,200 feet
Magnetometer	M-123	M-123
Positioning	GPS	GPS
Track lines	0.5 naut. Mile E-W	0.5 naut. Mile N-S
Anomaly map	Fig. 3	Fig. 4
Scale of original map	1/50,000	1/50,000
Map projection	TM	TM
Reference Magnetic Observatory	Kanoya (31°25.'2 N, 130°52.'9 E)	Hachijo (33°04.'6 N, 139°49.'3 E)
Reference value for an External field correction	46,320nT	46,384nT
Core field model	IGRF2005	IGRF2005
Contour interval	20nT	100nT
Epoch year	2005.11	2006.3

Cruise index	06OS	06IT
Area	Izu-Oshima	Io-Torishima
Period	Feb. 24 2006	Oct. 5 2006
Aircraft	YS-11	YS-11
Flight Altitude	3,800 feet	1,300 feet
Magnetometer	M-123	M-123
Positioning	GPS	GPS
Track lines	0.25~0.5 naut. Mile N-S	0.25~0.5 naut. Mile N-S and E-W
Anomaly map	Fig. 5	Fig. 6
Scale of original map	1/50,000	1/100,000
Map projection	TM	TM
Reference Magnetic Observatory	Hachijo (33°04.'6 N, 139°49.'3 E)	Kanoya (31°25.'2 N, 130°52.'9 E)
Reference value for an External field correction	45,213nT	46,390nT
Core field model	IGRF2005	IGRF2005
Contour interval	100nT	25nT
Epoch year	2006.2	2006.10

Cruise index	07IO	07MI
Area	Ioto	Miyakejima
Period	Jan. 23 2007	Jul. 10 2007
Aircraft	YS-11	YS-11
Flight Altitude	2,200 feet	4,800 feet
Magnetometer	M-123	M-123
Positioning	GPS	GPS
Track lines	0.25 naut. Mile N-S	0.5~1 naut. Mile N-S and E-W
Anomaly map	Fig. 7	Fig. 8
Scale of original map	1/50,000	1/100,000
Map projection	TM	TM
Reference Magnetic Observatory	Hachijo (33°04.'6 N, 139°49.'3 E)	Hachijo (33°04.'6 N, 139°49.'3 E)
Reference value for an External field correction	45,222nT	45,238nT
Core field model	IGRF2005	IGRF2005
Contour interval	100nT	50nT
Epoch year	2007.1	2007.7

Cruise index	08OS	09KU
Area	Izu-Oshima	Kuchinoerabujima
Period	Jul. 19 2008	Feb. 4 2009
Aircraft	YS-11	YS-11
Flight Altitude	3,800 feet	2,400 feet
Magnetometer	M-123	M-123
Positioning	GPS	GPS
Track lines	0.5 naut. Mile N-S	0.25~1 naut. Mile N-S
Anomaly map	Fig. 9	Fig. 10
Scale of original map	1/50,000	1/50,000
Map projection	TM	TM
Reference Magnetic Observatory	Hachijo (33°04.6' N, 139°49.3' E)	Kanoya (31°25.2' N, 130°52.9' E)
Reference value for an External field correction	45,254nT	46,310nT
Core field model	IGRF2005	IGRF2005
Contour interval	100nT	25nT
Epoch year	2008.7	2009.2

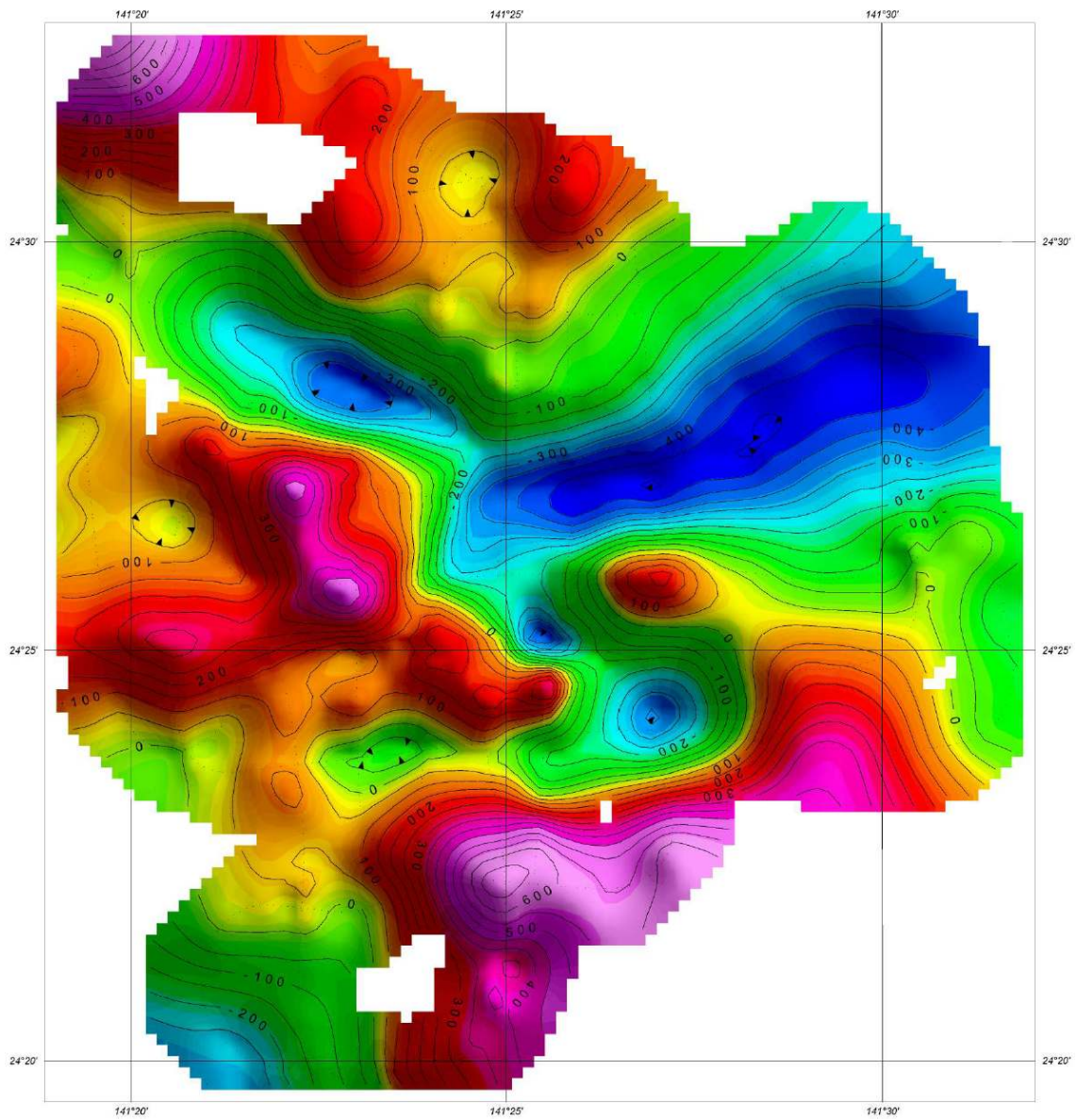


Fig.1 Geomagnetic total intensity anomaly map in and around Kita-Fukutokutai.

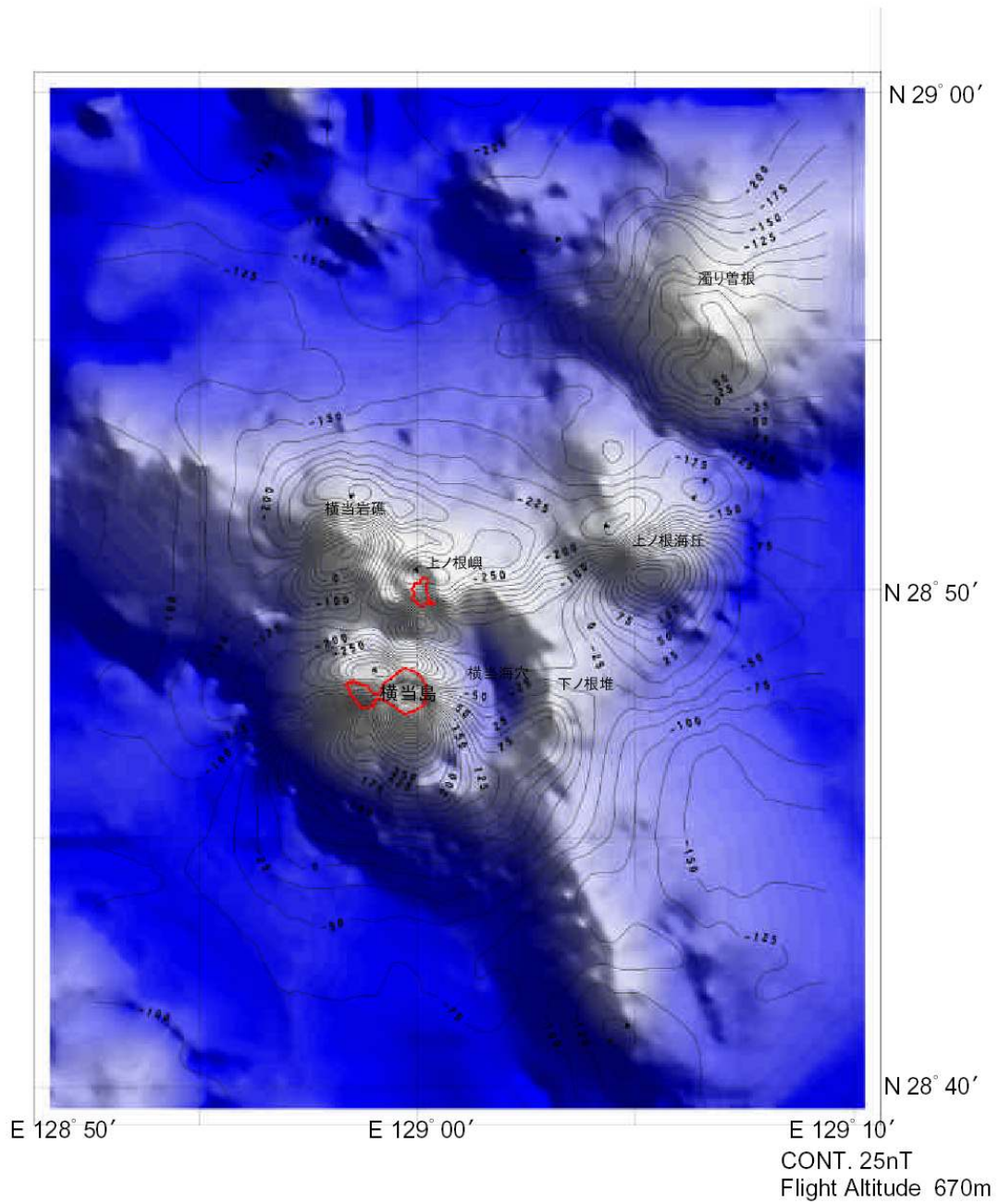


Fig.2 Geomagnetic total intensity anomaly map in and around Yokoatejima.

薩摩硫黄島地磁気全磁力異常図
平成17年11月7, 8, 9日 高度:1450m 1/150000

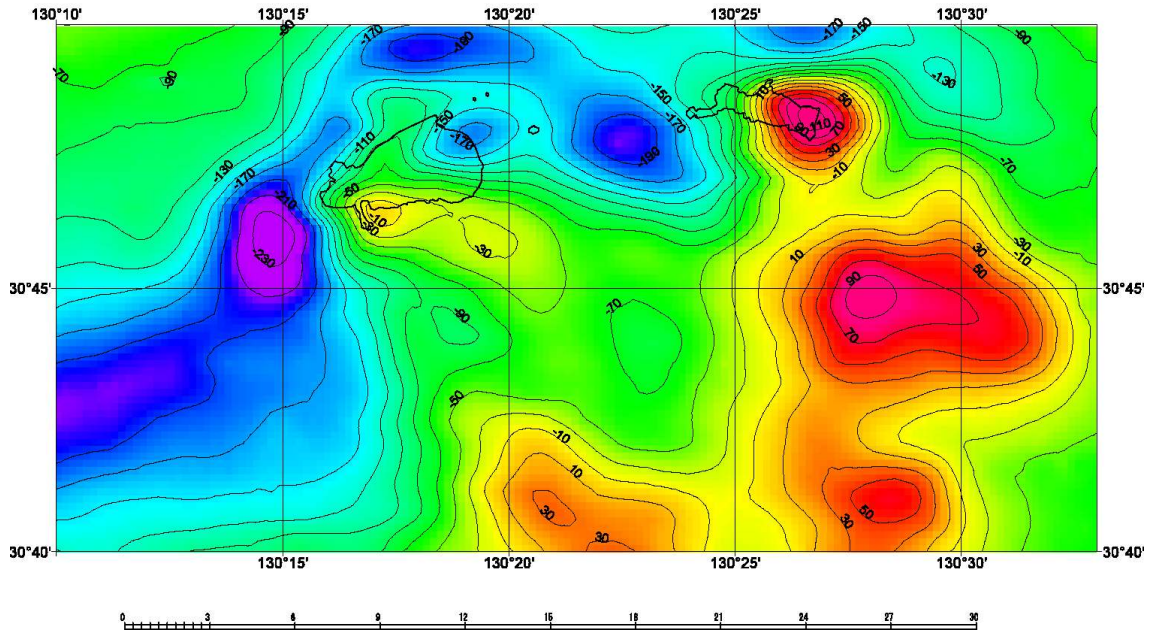


Fig.3 Geomagnetic total intensity anomaly map in and around Satsuma-Iojima.

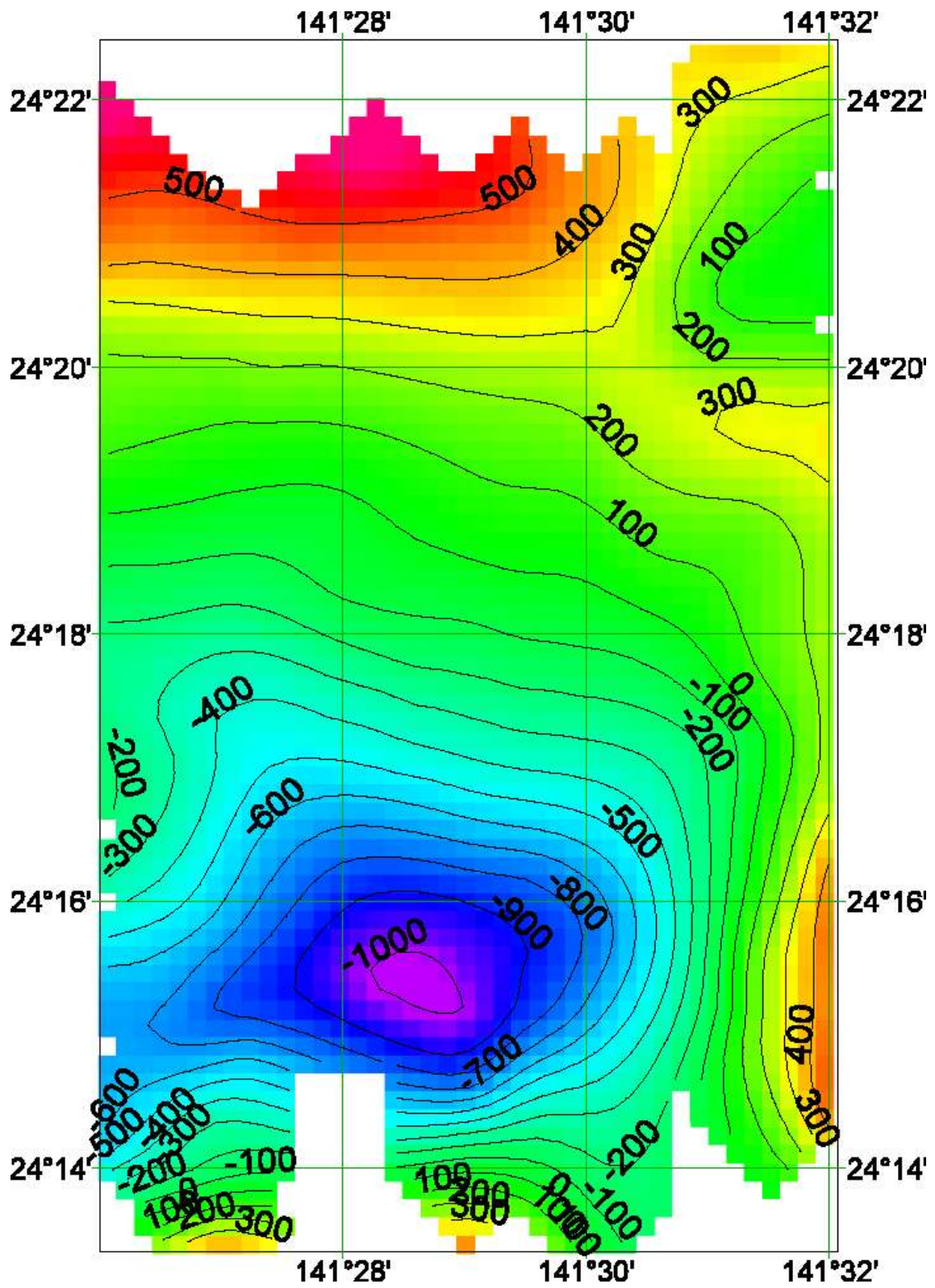


Fig.4 Geomagnetic total intensity anomaly map in and around Fukutoku-Okanoba.

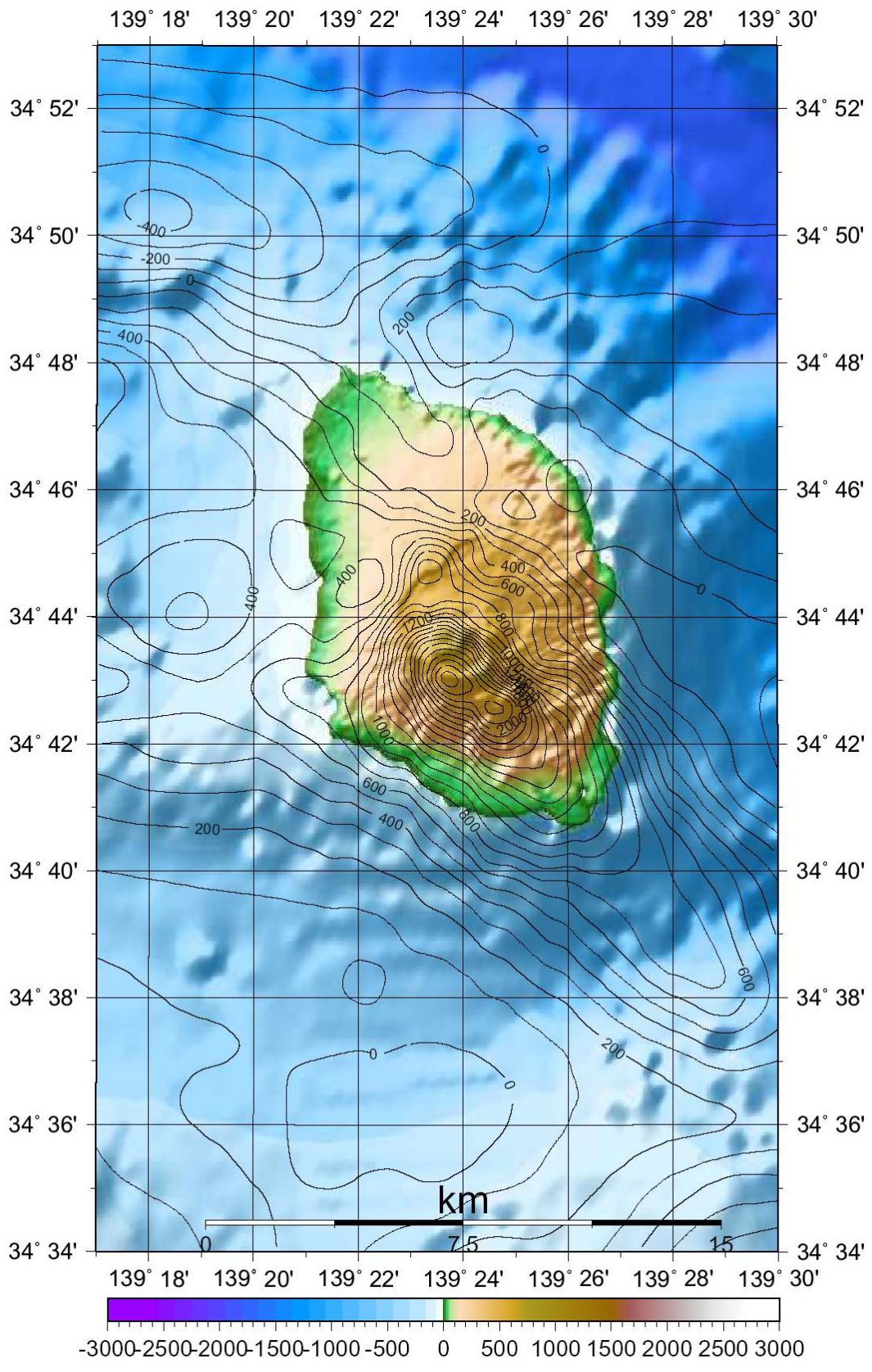


Fig.5 Geomagnetic total intensity anomaly map in and around Izu-Oshima

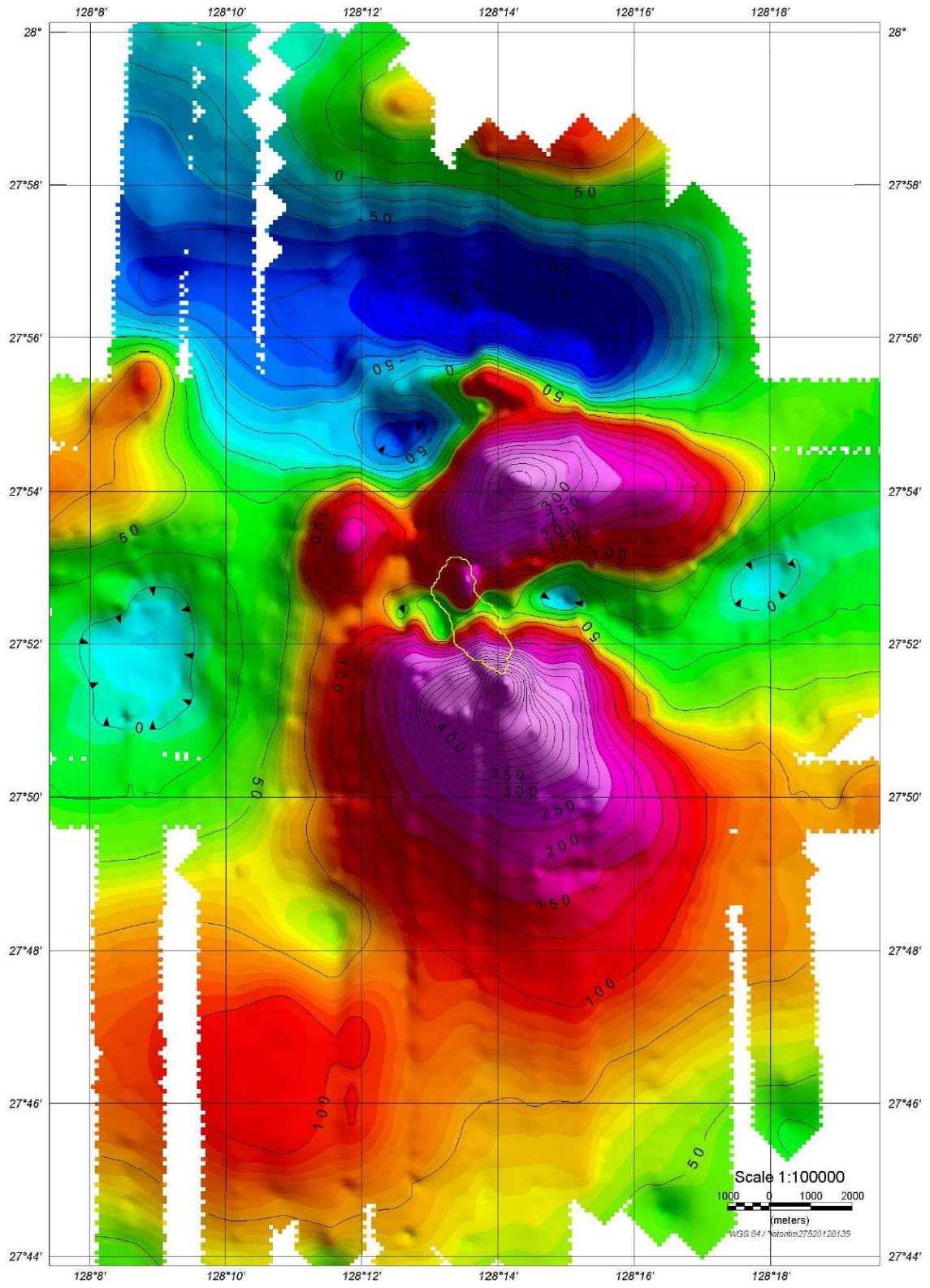


Fig.6 Geomagnetic total intensity anomaly map in and around Io-Torishima

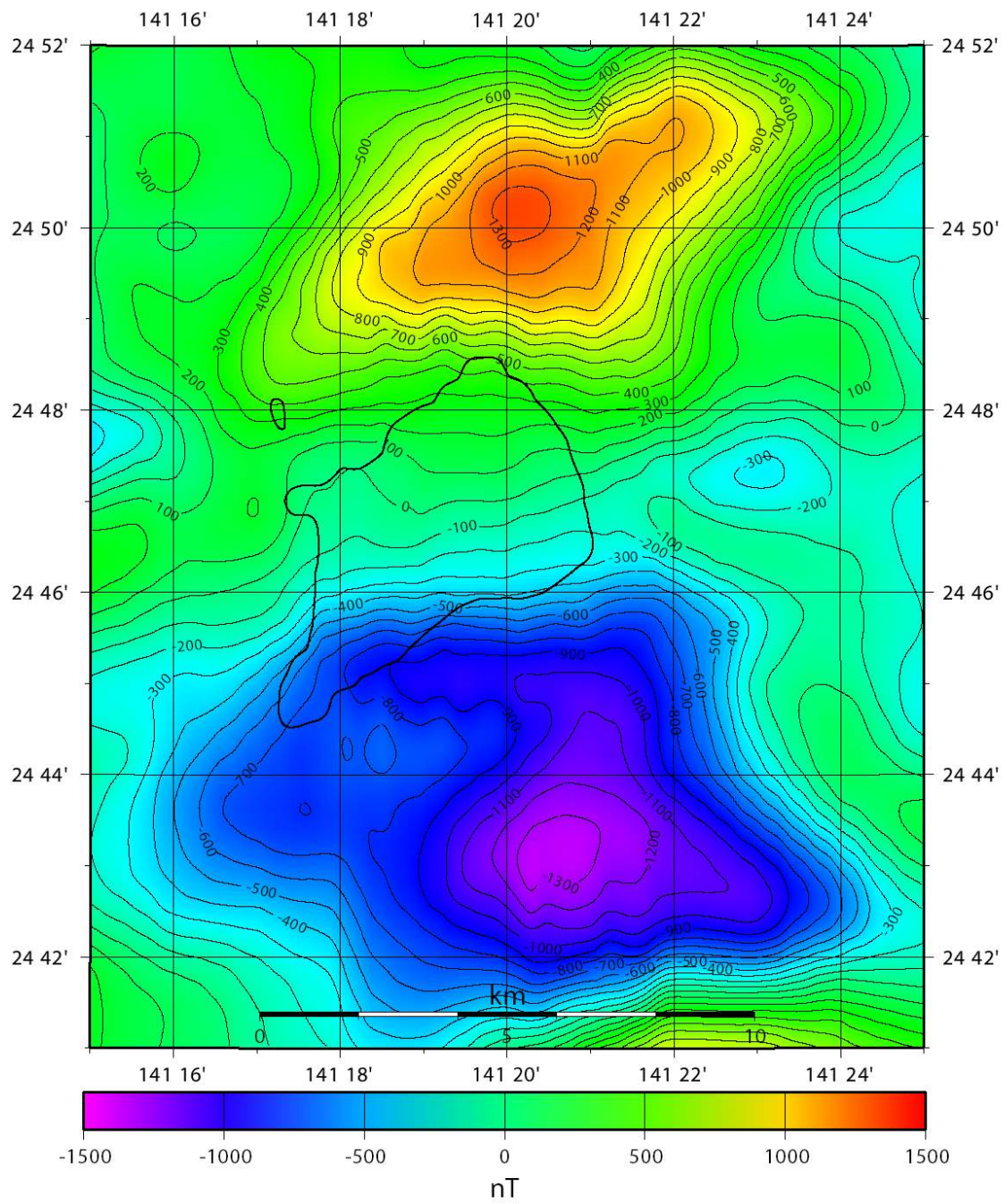


Fig.7 Geomagnetic total intensity anomaly map in and around Ioto.

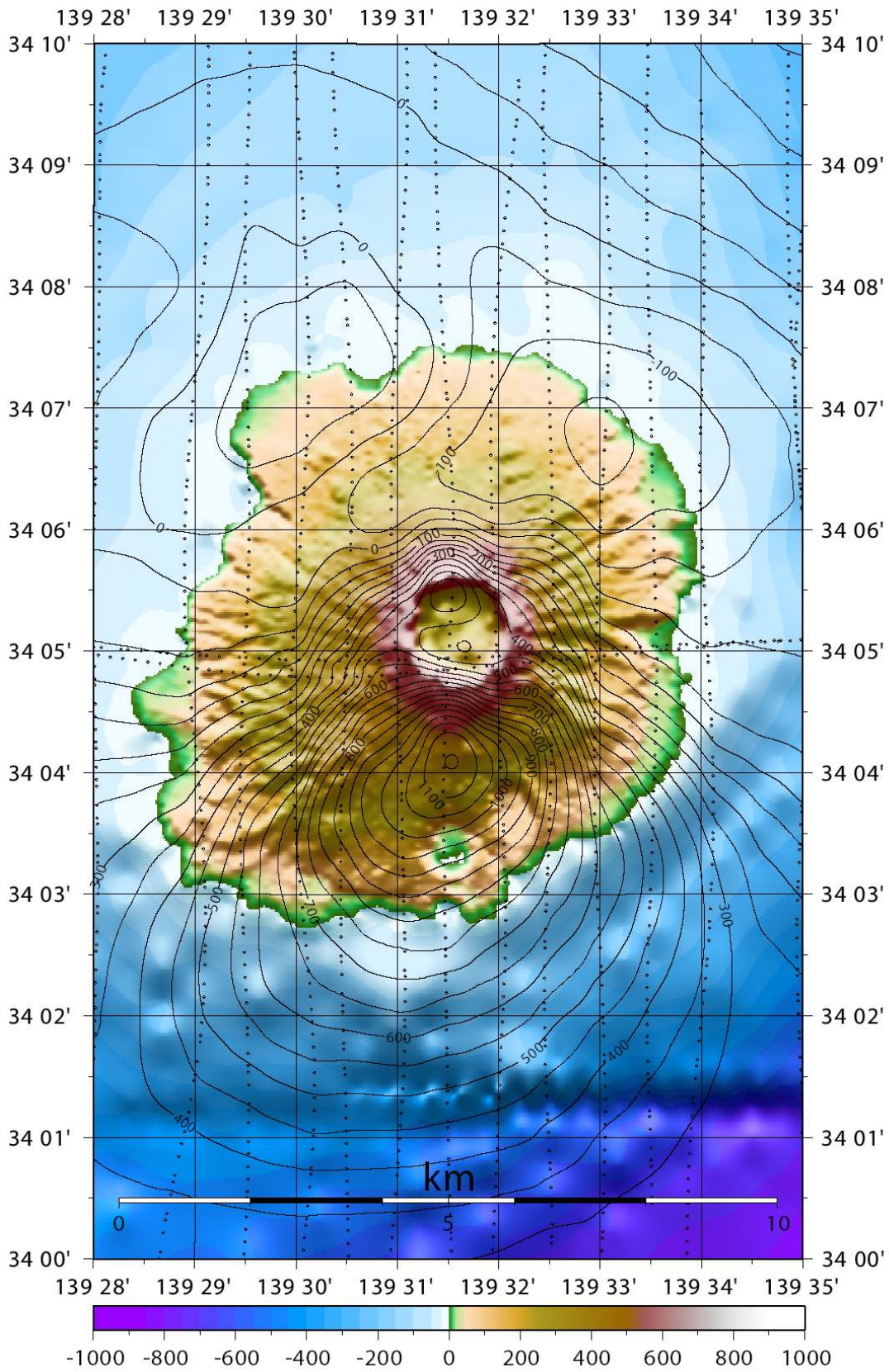


Fig.8 Geomagnetic total intensity anomaly map in and around Miyakejima.

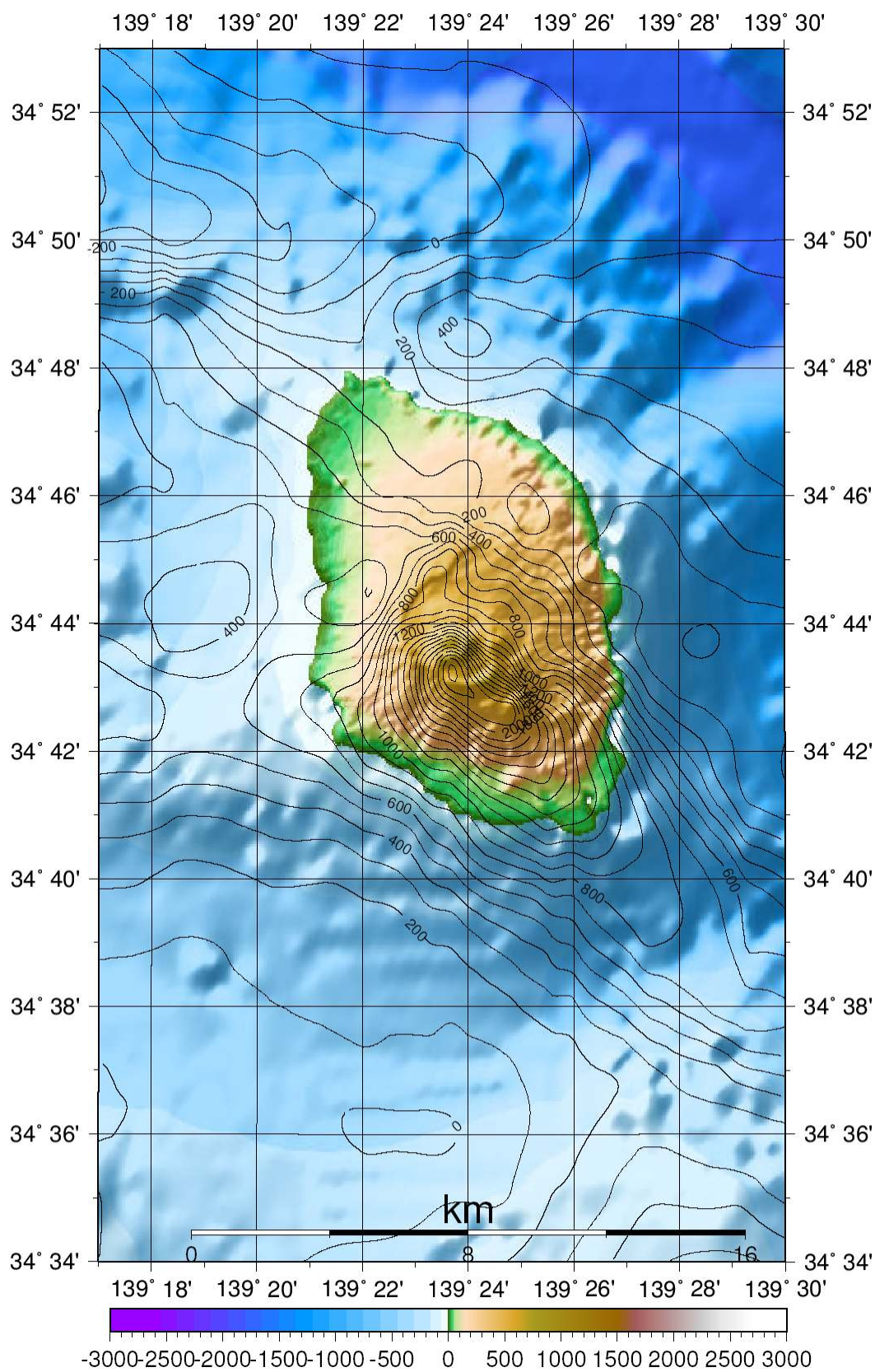


Fig.9 Geomagnetic total intensity anomaly map in and around Izu-Oshima

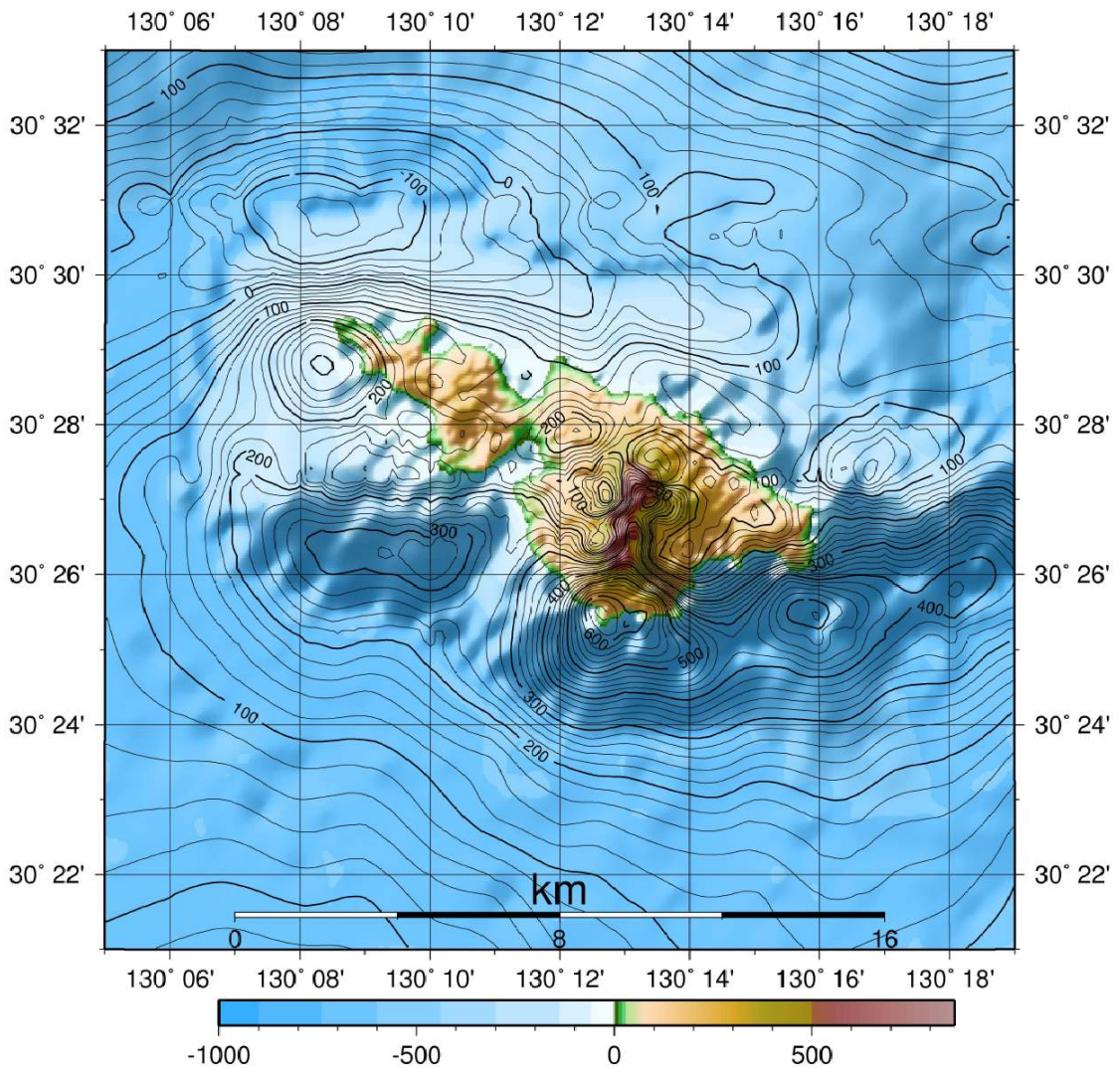


Fig.10 Geomagnetic total intensity anomaly map in and around Kuchinoerabujima