

Earth Magnetic Anomaly Grid (EMAG2) released

An Earth Magnetic Anomaly Grid (EMAG2) has been compiled from satellite, ship and airborne magnetic measurements. Magnetic anomaly maps provide insight into the subsurface structure and composition of the Earth's crust. While the grid was produced primarily to support navigation, the geological sciences and resource exploration, the accompanying visualizations may prove helpful to science educators in illustrating various aspects of Earth evolution, such as plate tectonics and crustal interaction with the deep mantle.

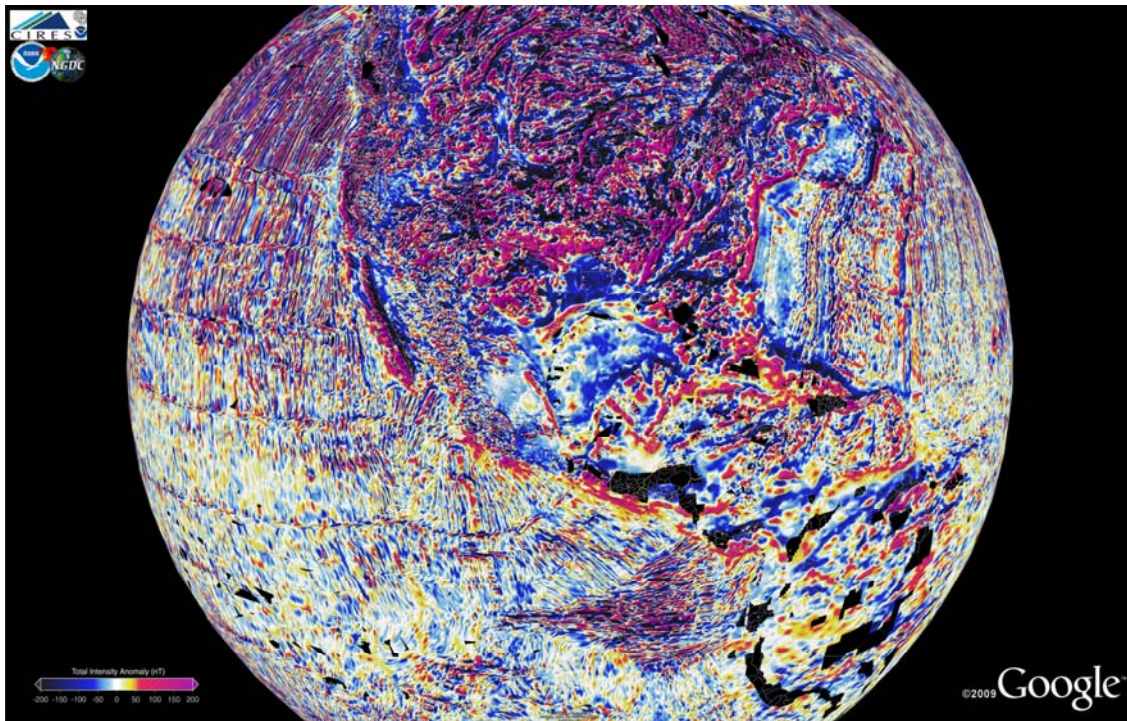


Figure 1: EMAG2 displayed in Google Earth[®]. This KMZ and further implementations for Google Maps[®] and NASA World Wind[®] are available at <http://bbs.keyhole.com> and <http://geomag.org>

EMAG2 is the result of an international collaboration based on contributions from over one hundred data providers worldwide. It updates the National Geophysical Data Center's earlier candidate for the World Digital Magnetic Anomaly Map (Maus et al., 2007). The resolution has been improved from 3 arc minutes to 2 arc minutes and the altitude has been reduced from 5 km to 4 km above geoid. Additional grid and trackline data have been included, both over land and the oceans. Interpolation between sparse tracklines in the oceans was improved by directional gridding and extrapolation using an oceanic crustal age model (Müller et al., 2008). The longest wavelengths (larger than 330 km) were replaced with the latest CHAMP satellite lithospheric field model MF6 (Maus et al., 2008). Further details are given in the EMAG2 publication (Maus et al., 2009), a draft of which is posted online at <http://geomag.org/info/Smaus/Doc/emag2.pdf>. The digital grid, images and various derived products (such as the implementation for Google Earth[®] displayed in Figure 1) are available on the EMAG2 home page (<http://geomag.org/models/emag2.html>).

Acknowledgments

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References

- Maus, S., U. Barckhausen, H. Berkenbosch, N. Bournas, J. Brozena, V. Childers, F. Dostaler, J. D. Fairhead, C. Finn, R. R. B. von Frese, C. Gaina, S. Golynsky, R. Kucks, H. Lühr, P. Milligan, S. Mogren, D. Müller, O. Olesen, M. Pilkington, R. Saltus, B. Schreckenberger, E. Thébault, and F. Caratori Tontini (2009), EMAG2: A 2-arc-minute resolution Earth Magnetic Anomaly Grid compiled from satellite, airborne and marine magnetic measurements, *Geochem. Geophys. Geosyst.*, under review.
- Maus, S., F. Yin, H. Lühr, C. Manoj, M Rother, J. Rauberg, I. Michaelis, C. Stolle, and R. D. Müller (2008), Resolution of direction of oceanic magnetic lineations by the sixth-generation lithospheric magnetic field model from CHAMP satellite magnetic measurements, *Geochem. Geophys. Geosyst.*, 9, Q07021, doi:10.1029/2008GC001949.
- Maus, S., T. Sazonova, K. Hemant, J. D. Fairhead, and D. Ravat (2007), National Geophysical Data Center candidate for the World Digital Magnetic Anomaly Map, *Geochem. Geophys. Geosyst.*, 8, Q06017, doi:10.1029/2007GC001643.
- Müller, R. D., M. Sdrolias, C. Gaina, and W. R. Roest, Age (2008), spreading rates, and spreading asymmetry of the world's ocean crust, *Geochemistry, Geophysics, Geosystems*, 9, doi:10.1029/2007GC001743, 2008.