



**EXPLANATION**

**Declination**  
 Contours of declination expressed in degrees. Declination is the horizontal angle between true north and the direction in which a magnetic compass points. It is considered positive or negative depending upon whether the end of a balanced compass needle points east or west of true north, respectively. Hachures point in direction of decreasing values.

**Secular Variation of Declination**  
 Contours of the estimated rate of change of declination (secular variation) expressed in minutes of arc per year. To apply change, add algebraically. Hachures point in direction of decreasing values.

Point value of declination expressed in degrees. Point values enclosed by a single contour are local maxima or minima.

Point value of the estimated rate of change of declination (secular variation) expressed in minutes of arc per year. To apply change, add algebraically. Point values enclosed by a single contour are local maxima or minima.

North and south magnetic poles. Magnetic poles are defined as the locations at which the horizontal magnetic intensity, computed from the degree and order ten spherical harmonic International Geomagnetic Reference Field 2000 model, is effectively zero at 2000.0.

Geomagnetic observatory recording data since 1990

DECLINATION CHART THE INTERNATIONAL GEOMAGNETIC REFERENCE FIELD, 2000

By Kenneth S. Rukstales and John M. Quinn 2001

**DISCUSSION**  
 This is one of five world charts showing the declination, inclination, horizontal intensity, vertical component, and total intensity of the Earth's magnetic field at mean sea level at the beginning of 2000. The charts are based on the International Geomagnetic Reference Field (IGRF) main model for 2000 and secular change model for 2000-2005. The IGRF is referenced to the World Geodetic System 1984 ellipsoid. Additional information about the USGS geomagnetic program is available at <http://geomag.usgs.gov/>. This and other USGS publications are available on-line at <http://geomag.cr.usgs.gov/>.

**ACKNOWLEDGMENTS**  
 The IGRF is produced by the International Association of Geomagnetism and Aeronomy (IAGA) Division V, Working Group V-8. Analysis of the Global and Regional Geomagnetic Field and its Secular Variation. Production of the IGRF depends on the efforts of the staff of magnetic observatories and survey organizations worldwide, and the free interchange of data. The ground satellite magnetic field data, supplied by the British Space Research Institute, were especially valuable in the production of the 2000 epoch IGRF model and charts.

**SELECTED REFERENCES**  
 Barton, C.E., Barrick, D.R., and Quinn, J.M., eds., 1997, Analysis and modeling of global magnetic field data and the IGRF. *Journal of Geomagnetism and Geoelectricity*, v. 49, no. 2, 467 p.  
 Defense Mapping Agency, 1999, Department of Defense World Geodetic System 1984. Defense Mapping Agency Technical Report TR 8306.1, second edition.  
 IAGA Division V, Working Group V-8, 2000, International Geomagnetic Reference Field - 2000. *Journal of Pure and Applied Geophysics*, v. 157, p. 179-182.  
 Macmillan, S., and Quinn, J.M., 2000, The derivation of World Magnetic Model 2000. British Geological Survey Technical Report WM0017R, 25 p.  
 Macmillan, S., and Quinn, J.M., 2000, The 2000 revision of the joint IAGA geomagnetic field models and an IGRF 2000 candidate model. *Journal of Earth, Planets and Space*, v. 52, no. 1, p. 149-162.