



World Data Centre for Geomagnetism, Edinburgh

INTRODUCTION

The World Data Centre for Geomagnetism, Edinburgh is based at the Scottish headquarters of the British Geological Survey.

We operate seven geomagnetic observatories worldwide and are active in scientific areas such as understanding and modelling the Earth's internal magnetic field and space weather.

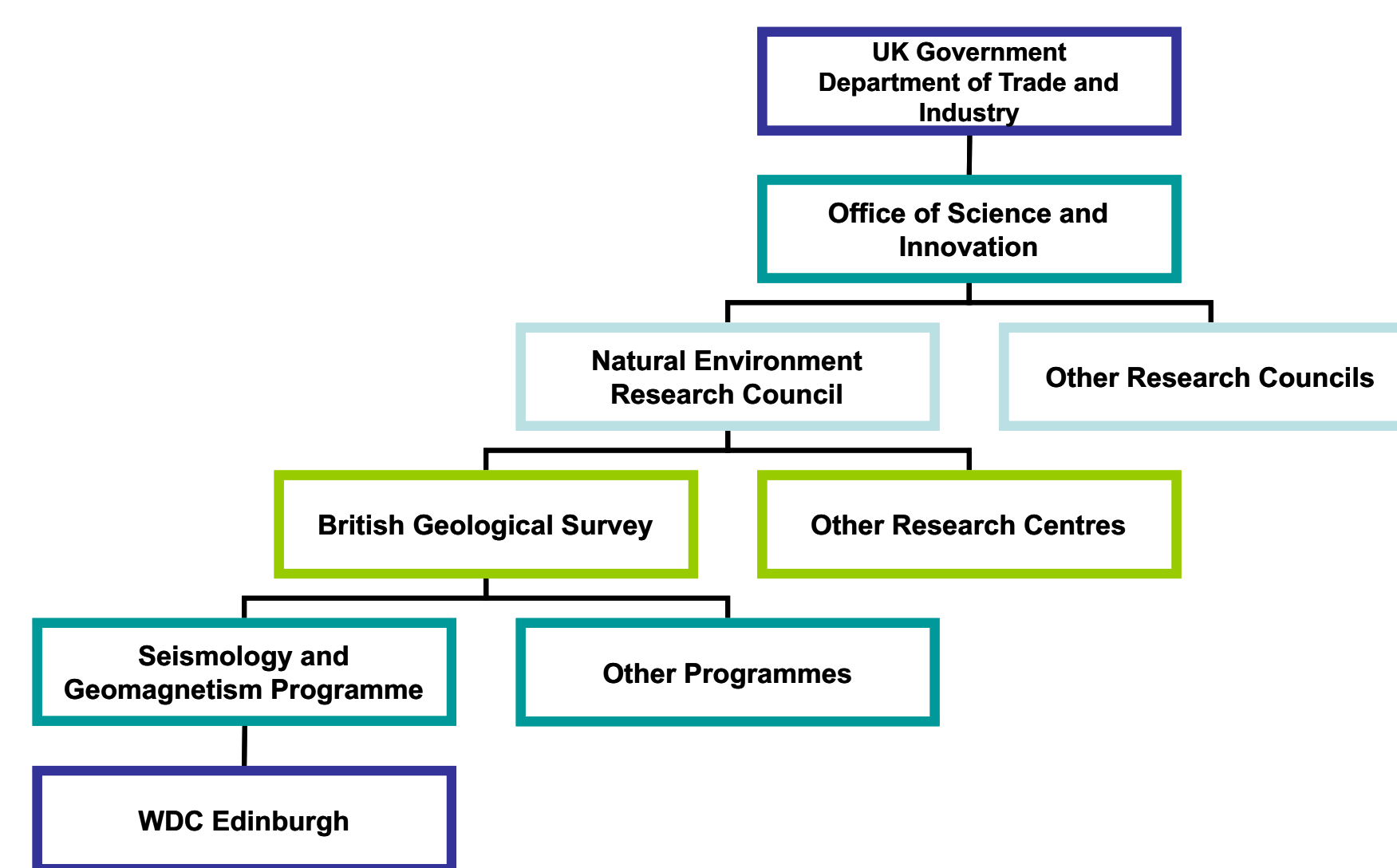
We are also active in international initiatives to help establish or upgrade geomagnetic observatories in developing countries and in remote locations. This work feeds into our role as a World Data Centre and our science benefits from our increasing data resource.



1. ORGANISATION OF THE WDC WITHIN OUR INSTITUTION

The World Data Centre for Geomagnetism, Edinburgh is operated by the British Geological Survey (BGS), part of the UK's Natural Environment Research Council. Operation of the WDC is funded as part of the National Geomagnetism Service project.

Five people are actively involved in the operation of the WDC although all have additional roles in the workplace.



2. TECHNICAL ORGANISATION

DATA ACQUISITION

We receive most of our data via FTP and email. We also get data on CD, DVD and paper records through the mail. Some of our data also comes from the internet and other data sources. We hope to set up data mirroring between ourselves and other WDC's.

PROCESSING

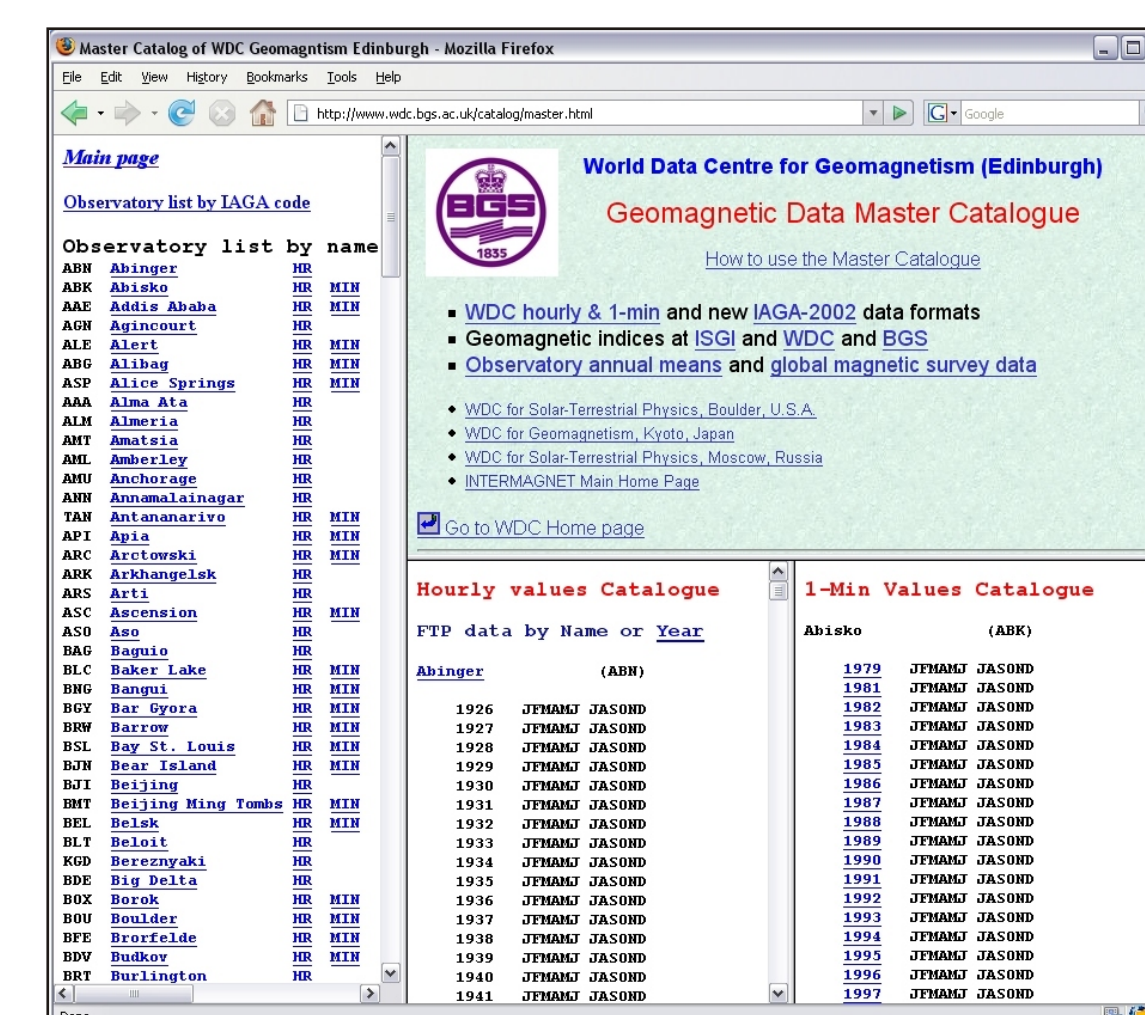
All data are checked for integrity and are converted into a standard format before distribution. Hourly means are stored and distributed in WDC exchange format. One-minute data are stored in INTERMAGNET binary format based on the model developed by the USGS/NGIC. This retains sub-nanotesla data resolution. It is then converted to WDC exchange format for distribution.

STORAGE

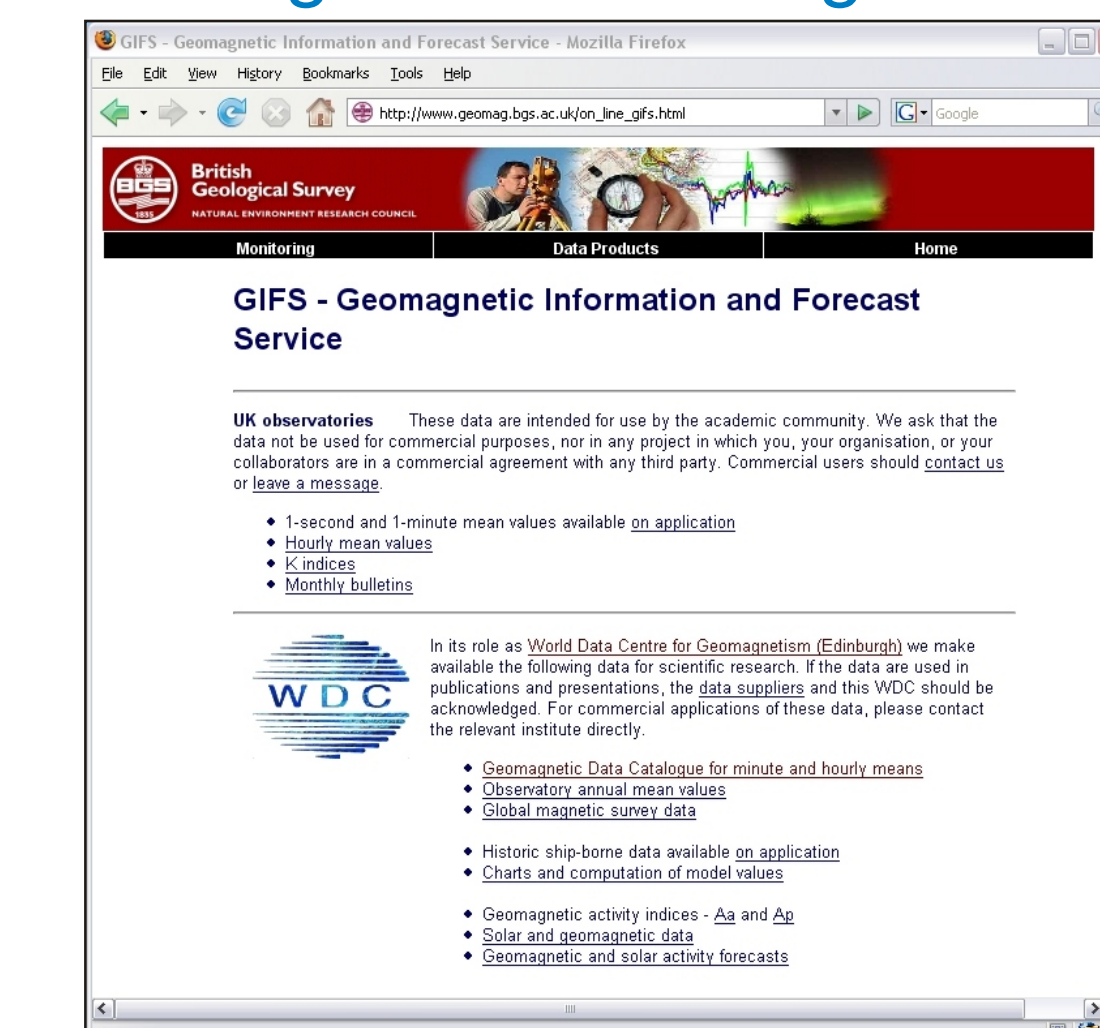
Electronic data are stored in a organisation-wide Storage Area Network with over 100 Terabytes capacity. This is backed up regularly to tape.

DISTRIBUTION

Data are currently distributed through two websites (shown below). One-minute and hourly mean data are available through an FTP helper website called the Geomagnetic Data Master Catalogue. This was originally set up by the Danish Meteorological Institute and transferred to the BGS in 2007. Other data sets (annual means, global survey data, indices etc.) are available from our BGS website where users can access data via CGI web forms.



www.wdc.bgs.ac.uk/catalog/master.html

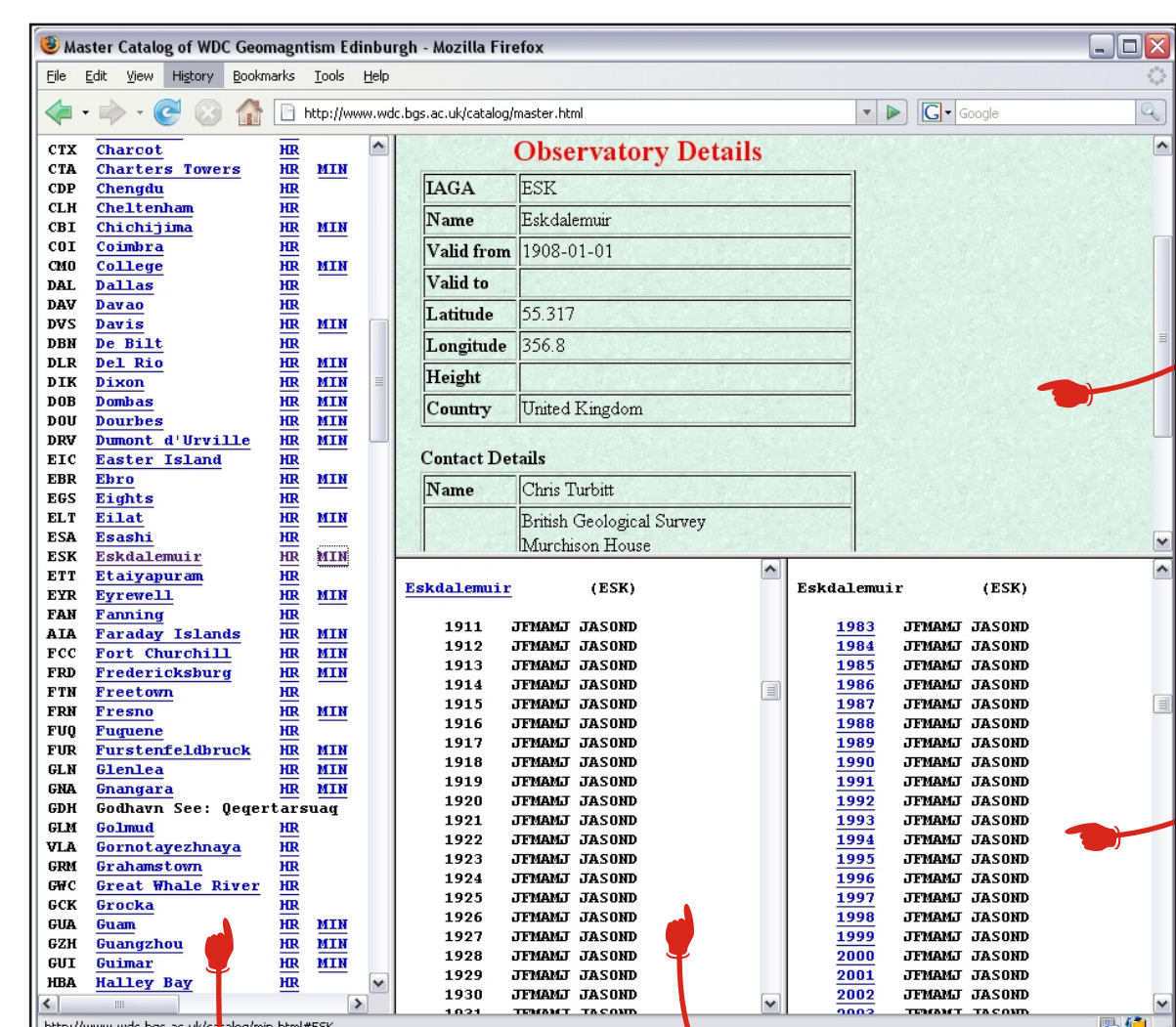


www.geomag.bgs.ac.uk/on_line_gifs.html

3. PRESENT STATE OF METADATA

We hold a complete record of observatory information (location, dates of operation etc.) and associated contact and acknowledgement information.

Catalogues of our data holdings are available. The online Geomagnetic Data Catalogue is available for one-minute and hourly mean data. Users can also submit a query online to generate a current catalogue of annual means.



Observatory information

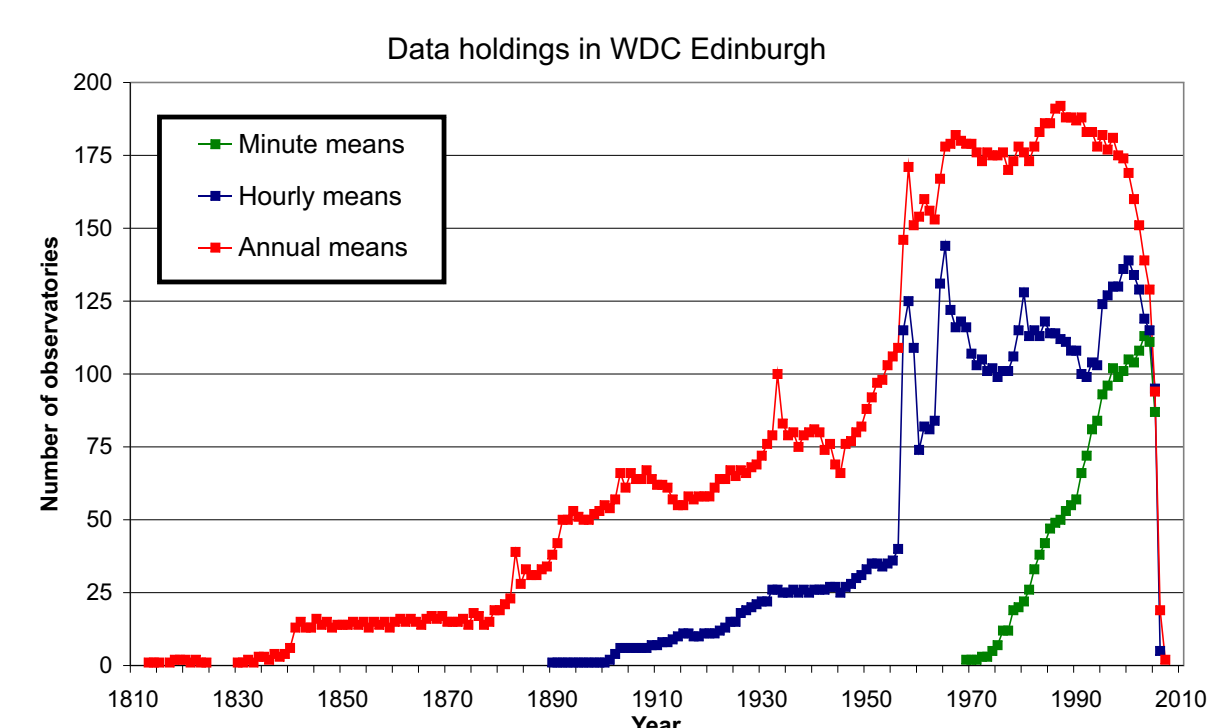
Catalogue of one-minute data

Catalogue of hourly mean data

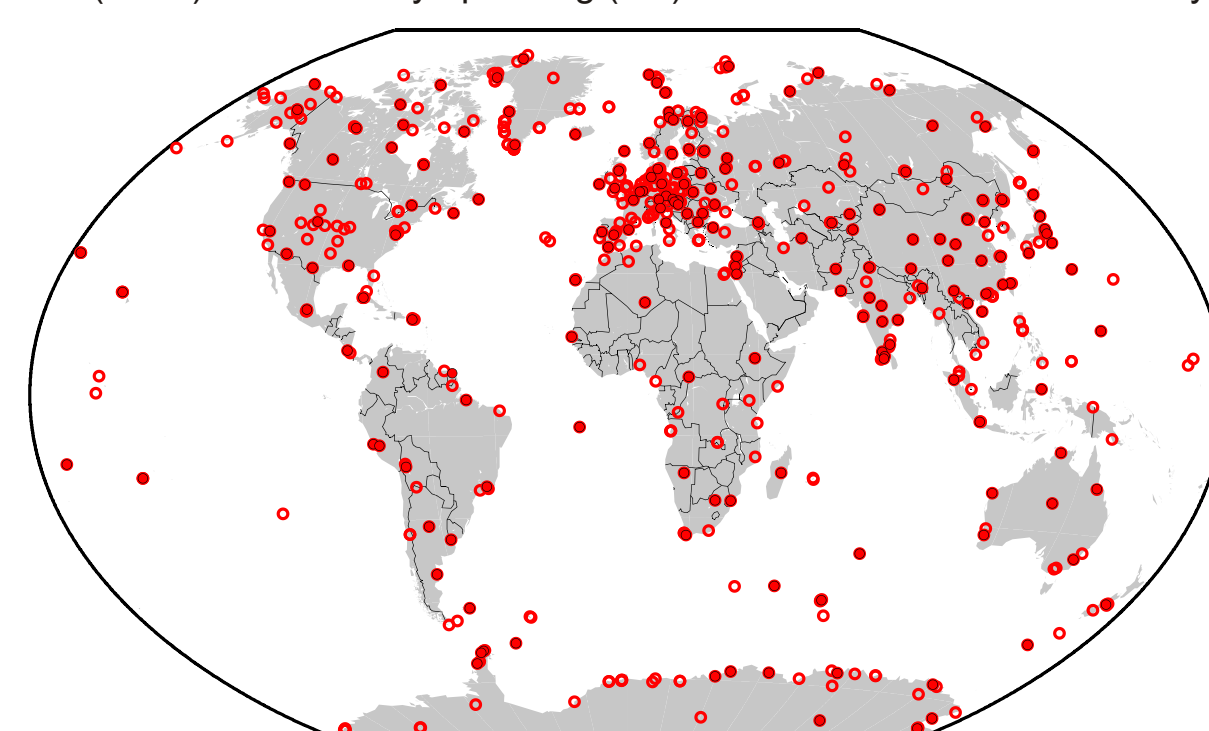
List of available observatories

4. PRESENT STATE OF DATA CONTENT

We hold one-minute, hourly and annual mean geomagnetic observatory data. We also hold an extensive range of global survey data, facilities to access global magnetic field model values, geomagnetic indices (e.g. *ap* and *aa*), solar and geomagnetic forecasts and historic ship-borne data.



Plot of all (circle) and currently operating (dot) observatories with data held by WDC

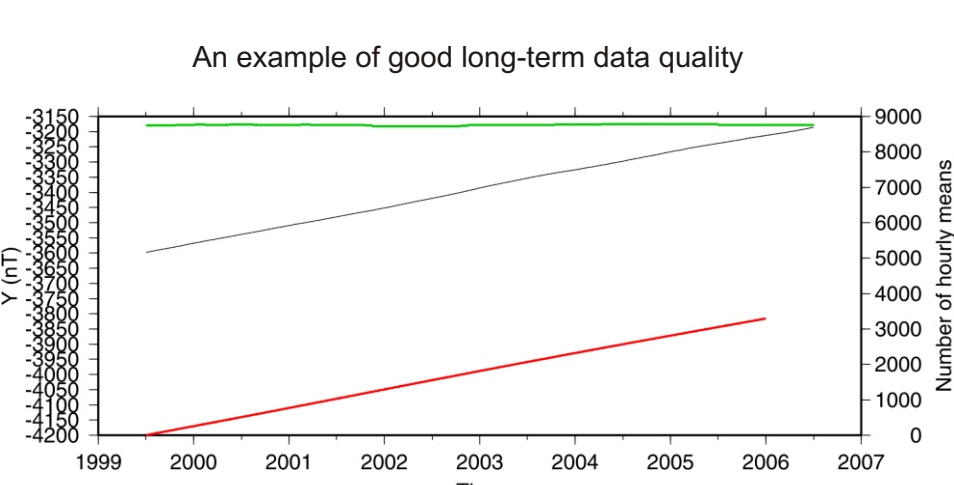


5. MAJOR ACTIVITIES OF WDC

Our major activity is the acquisition and distribution of geomagnetic data. Since 2007 we have taken over the operation of the Geomagnetic Data Catalogue from the WDC Geomagnetism, Copenhagen.

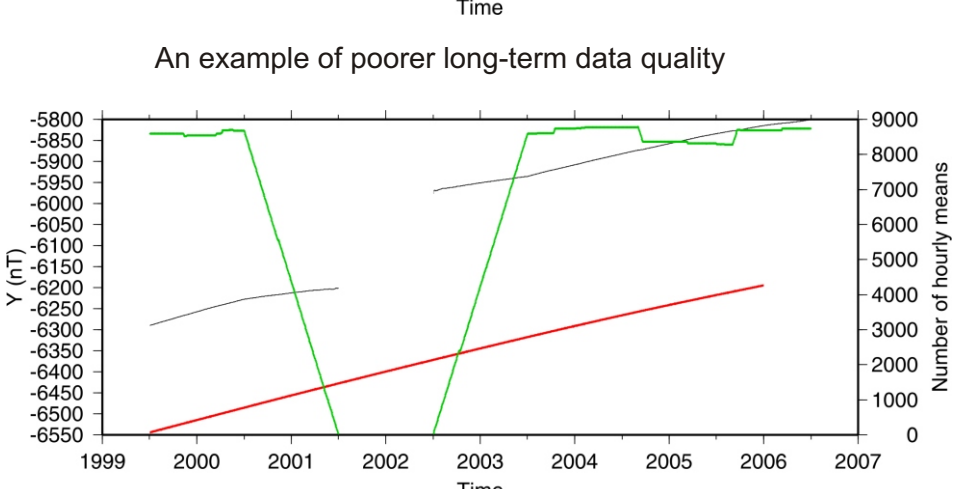
We are interested in the technical aspect of how to distribute data effectively to users and are looking at ways to utilise modern internet technology to improve our data services.

We also examine the quality of the data received to check data standards. For example, looking at moving averages of hourly mean values and comparing them against independent models can highlight possible errors in the data.



Geomagnetic data from 1999-2006 for two example observatories. Data is shown for the Y component of the field.

Black - moving annual averages of hourly mean values



Red - equivalent value from a global model derived from satellite data CHAOS (Olsen, 2006)

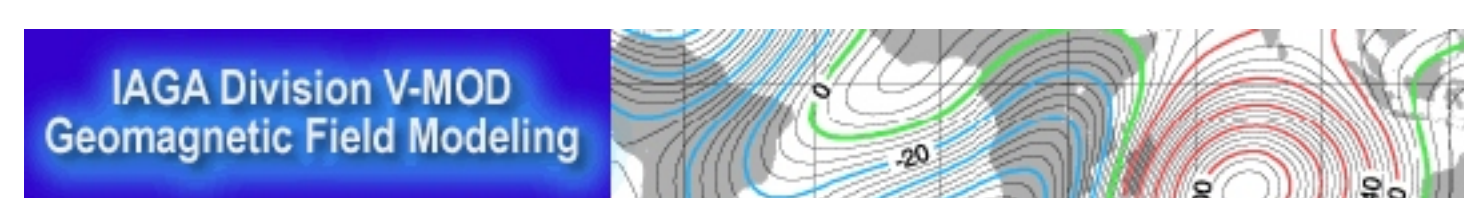
Green - number of hourly means making up each annual mean

6. LINKS WITH INTERNATIONAL PROJECTS

The WDC for Geomagnetism, Edinburgh is linked closely with the INTERMAGNET programme: a network of international standard geomagnetic observatories (www.intermagnet.org). Data submitted to INTERMAGNET undergoes rigorous quality control. We are a source for this INTERMAGNET data.



We are also linked with the international global geomagnetic modelling community and all the data submitted to our WDC helps modellers gain extra information about the Earth's internal magnetic field.



Long-term data sets of observatory data or geomagnetic indices are of interest to the space weather community. For example, we can examine the influence of solar variability on the Earth and it's climate using geomagnetic data.



7. MAJOR CHALLENGES

Our WDC's current challenge is to consolidate all our newly acquired and previously held data holdings into one single point of reference for the user. We wish to use new and emerging technologies to help us provide data over the internet to users in a form that is convenient to them.

The WDC system as a whole faces similar challenges to remain relevant by keeping up with modern technology and data exchange techniques. Historical data needs to be digitised and tabulated to be made available electronically. However this takes significant time and manpower to achieve. Data-sharing links between similar WDCs across the world could also be improved to enhance the availability of data.

ACKNOWLEDGEMENTS

We would like to thank all at the Danish Meteorological Institute. Particularly Jürgen Matzka in his assistance during the transfer of the Geomagnetic Data Master Catalogue and Ole Rasmussen for his care and upkeep of this important data set.

This poster is the work of Sarah Reay, Ewan Dawson, Susan Macmillan, Simon Flower and Tom Shanahan.

