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Towards A Metadata Standard For Geomagnetic Observatory Data

Sarah Reay¹ (sjr@bgs.ac.uk), Ewan Dawson¹, Simon Flower¹
Don Herzog², Susan Macmillan¹

1. British Geological Survey, Edinburgh, UK
2. National Geophysical Data Center, Boulder, Colorado USA

Metadata, citation and similar papers at core.a



What is Metadata?

“all the information, additional to the raw data itself, which a potential user of the data would need to know to be able to make full and accurate use of the data in a subsequent scientific analysis...”

Sufi, S., & Mathews, B. (2004). CCLRC scientific metadata model: version 2. CCLRC Technical Report: DL-TR-2004-001.

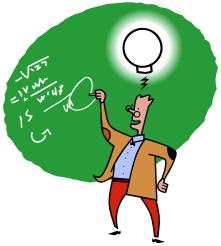


Benefits of Metadata (1)



Data Archive

- Metadata preserves the value of data for posterity.
- It protects against loss of organisational knowledge as personnel or institutes change.



Data Assessment

- Metadata describes the data.
- It gives us data provenance (QC history, processing and transformation steps etc).
- It is a means of declaring data limitations.

Benefits of Metadata (2)



Data Discovery

- Metadata can help other people find your data... and then obtain and use it.



Data Transfer

- Metadata is increasingly used by software systems to ingest, manipulate and analyse data.

Data Distribution

- Standardised metadata can allow participation in global data clearinghouse initiatives e.g. GEOSS, INSPIRE, WDS

Metadata Standards



- Metadata standards are a common set of terms and definitions in a structured format.
- No standard is perfect fit for geomagnetic data.
- Standards for geospatial data (FGDC, ISO) could provide framework for a geomagnetic profile.
- Temporal aspect is difficult to handle.
- Standards are complex for data providers to populate.



Why is it important?

To improve curation of data at WDCs

- Addressing inconsistencies within data holdings is difficult without metadata e.g. Apia observatory
- A clear 'paper-trail' of any transformations or corrections e.g. Eskdalemuir hourly means

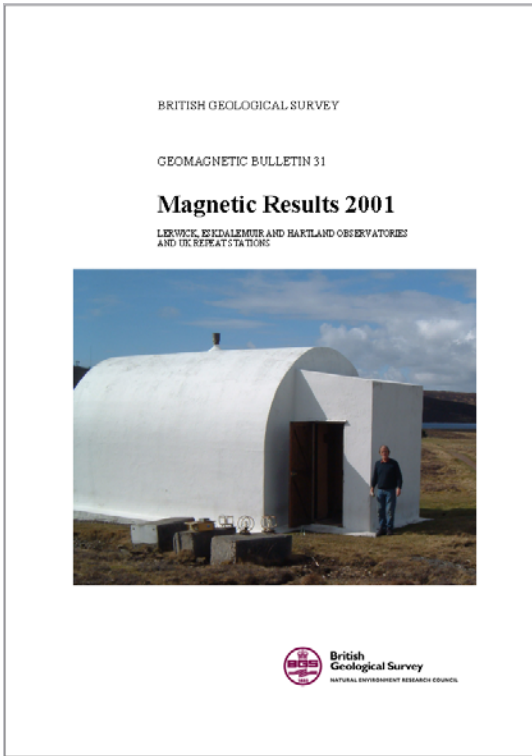
To give clear quality assurance to researchers

- Assisting data selection for global models
- Negate the need for 'preliminary', 'definitive' definitions

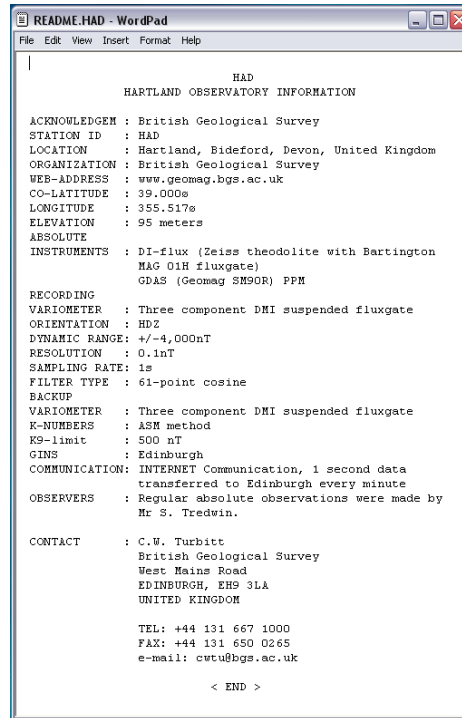
Good data provenance is necessary for good quality science!



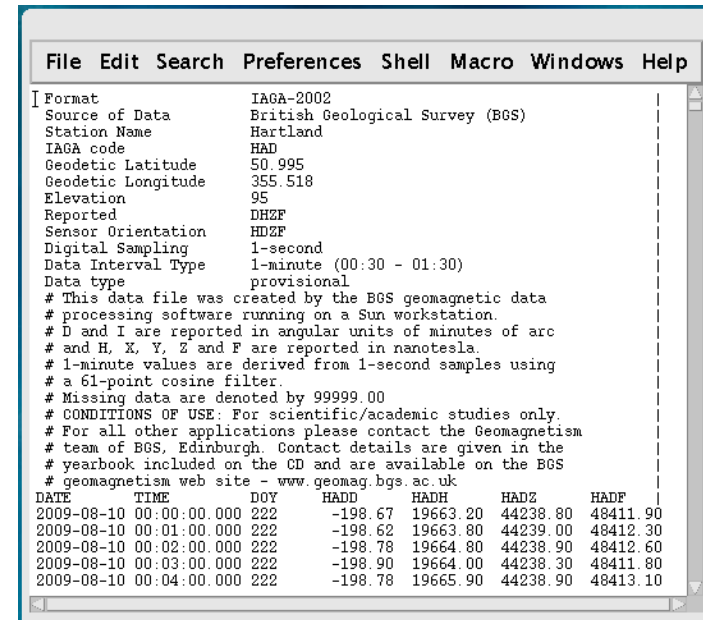
Current Geomagnetic Metadata Sources



Observatory yearbooks



INTERMAGNET
readme



IAGA-2002
file header



Requirements for geomagnetic metadata

- **Contact Information**
Name, address, institute information, responsible persons.
- **Data Description**
Type of data, nature of the data, possible applications.
- **Station Description**
Coordinates, elevation, possibly photographs and maps.
- **Instrumentation**
Types of instruments in use.
- **Data Processing**
Processes and methodology used to process the data from instrument recordings to the final definitive values.
- **Data Quality**
Assessing the quality of the data set.
- **Distribution**
How and where the data may be acquired.



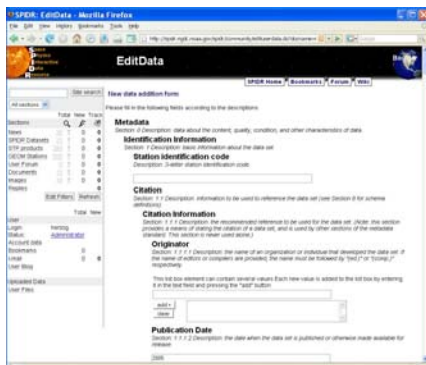
WDC efforts in metadata

- WDCs at Edinburgh, Boulder and Kyoto have begun to discuss what is required in a metadata standard.
- WDC hold limited metadata currently:



Edinburgh

- Holds simple metadata
- Requested further basic information from data providers with annual 'call-for-data'



Boulder

- Beginning to use a FGDC standard for data held in SPIDR
- Complex for data providers to fill-in



Next Steps? “Don't Duck Metadata”

- Documenting data is part of the scientific process
- Data providers are encouraged to keep metadata records of some form: yearbooks, free-form text
- WDCs will gradually request and this store metadata
- Better records of data provenance and interoperability will lead to better science!





Questions?

sjr@bgs.ac.uk

Acknowledgments

World Data Centre, Boulder and World Data Centre, Kyoto

References

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- The British Atmospheric Data Centre: Curation and Facilitation, Bryan Lawrence, NCAS/BADC, Rutherford Appleton Laboratory, CCLRC
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- Martini, D. and Mursula, K., 2006. Correcting the geomagnetic IHV index of the Eskdalemuir observatory, *Ann. Geophys.*, 24, 3411-3419

