

# World Data Centre for Geomagnetism, Edinburgh: New data portal, API, and metadata tools

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## INTRODUCTION

# World Data Centre for Geomagnetism, Edinburgh



- The World Data Centre (WDC) for Geomagnetism, Edinburgh serves the geomagnetism community by hosting and providing access to geomagnetic data.
- This includes:

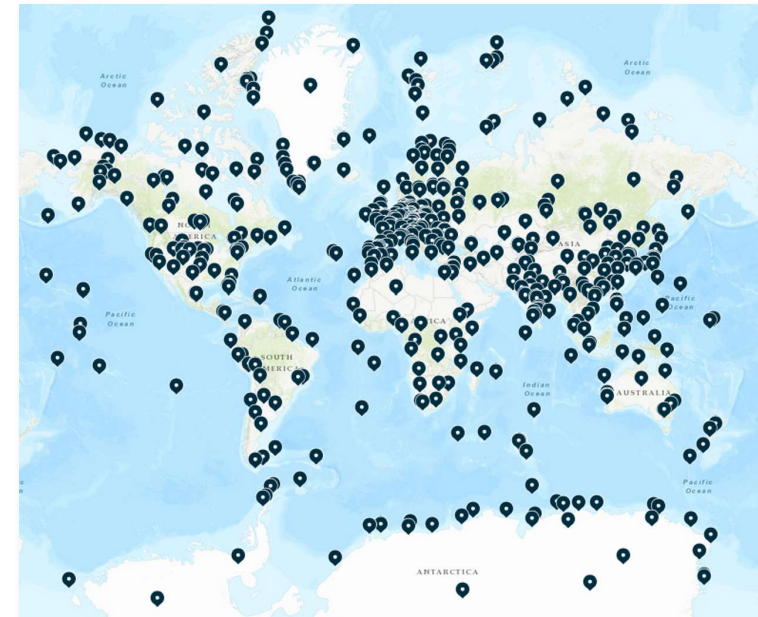
Data and metadata for ~500 magnetic observatories worldwide.

Definitive geomagnetic observatory data:  
annual means (from 1813), hourly means (from 1883), minute means (from 1969)

Magnetic survey records & magnetic field models.

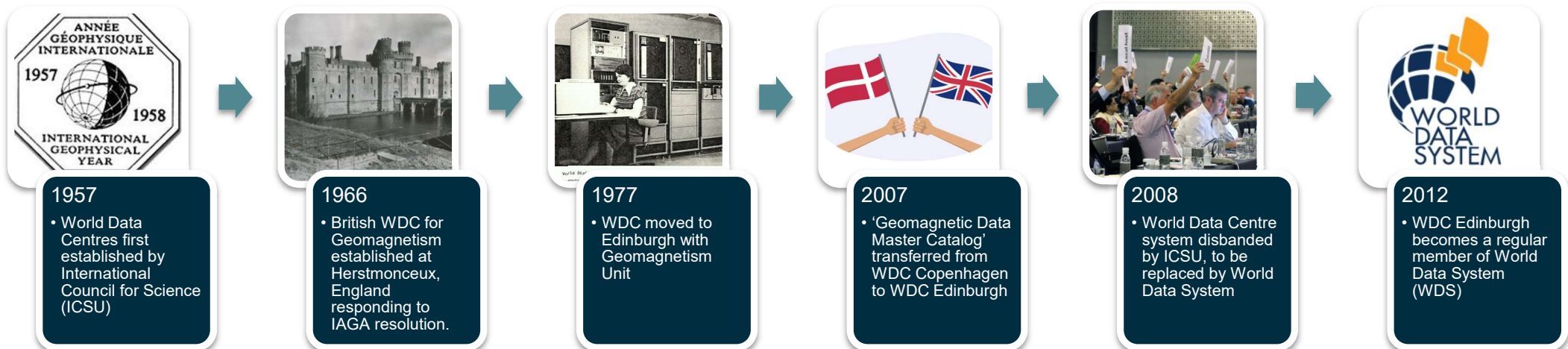
Historic UK magnetograms (from 1850), including an online archive of scans.

Physical storage of historic observatory yearbooks from UK and worldwide.



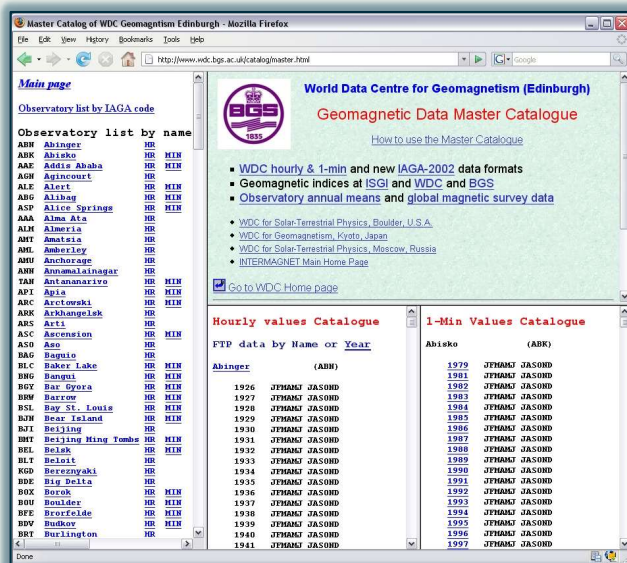
## INTRODUCTION

# History of the World Data Centre for Geomagnetism, Edinburgh



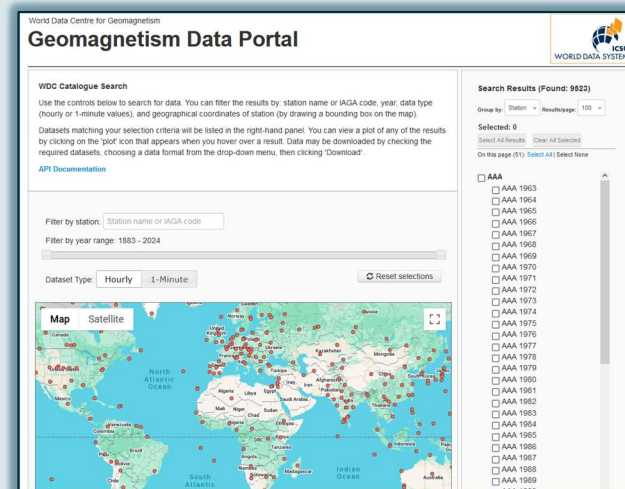
## INTRODUCTION

# Issues with the WDC Edinburgh services

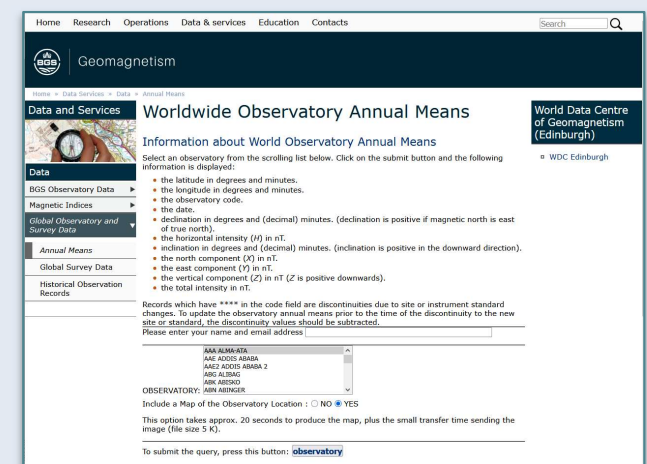


- Website used frames
- Data delivered by FTP

- Web browsers no longer allow FTP access in browser



- Data Portal and webservice developed
- Didn't fully replace previous functionality
- Not fully integrated to back-end processes



- Annual mean data delivered from a different website to the hourly & minute data



## NEW DEVELOPMENTS

# New WDC Portal

- Launched October 2024

## Data discovery

- Temporal, spatial and text-based filtering.
- Filter by geographic or geomagnetic coordinates (quasi-dipole or dip angle).

**Geomagnetism** World Data Centre for Geomagnetism

Tutorial FAQs Contact

**Map** **Data**

**Observatory Filters** **Reset Filters**

Text Filter

☒ Geographic ☐ Geomagnetic

Min Latitude: -90 Max Latitude: 90

Min Longitude: -180 Max Longitude: 180

**Reset Selection**

**Selected Observatories**

<input checked="" type="checkbox"/>	Code	Name	Details
<input checked="" type="checkbox"/>	COI	Coimbra	<a href="#">Details</a>

**All Observatories**

<input checked="" type="checkbox"/>	Code	Name	Details
<input type="checkbox"/>	ABN	Abinger	<a href="#">Details</a>
<input type="checkbox"/>	ABK	Abisko	<a href="#">Details</a>
<input type="checkbox"/>	ADA	Adak	<a href="#">Details</a>
<input type="checkbox"/>	AAE	Addis Ababa	<a href="#">Details</a>
<input type="checkbox"/>	AGN	Agincourt	<a href="#">Details</a>
<input type="checkbox"/>	ALE	Alert	<a href="#">Details</a>

Explore the new portal: [wdc-dataportal.bgs.ac.uk](http://wdc-dataportal.bgs.ac.uk)

## NEW DEVELOPMENTS

# New WDC Portal

## Data discovery

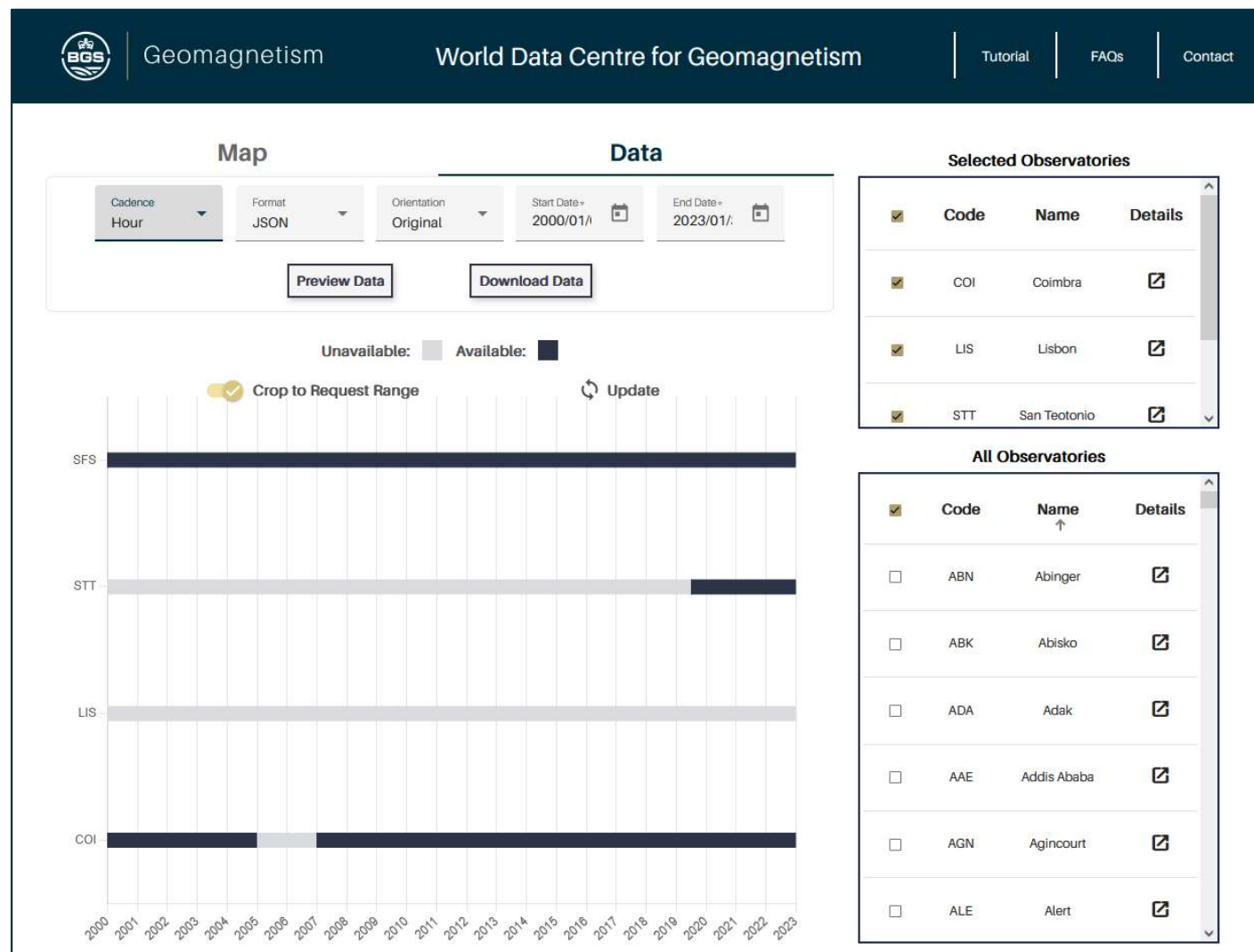
- Data availability can be displayed as a chart.

## Larger downloads

- Up to 10 years of minute means and 50 years of hourly means available in a single download.

## Range of Formats

- IAGA-2002, WDC, JSON, COV-JSON, XML and CSV



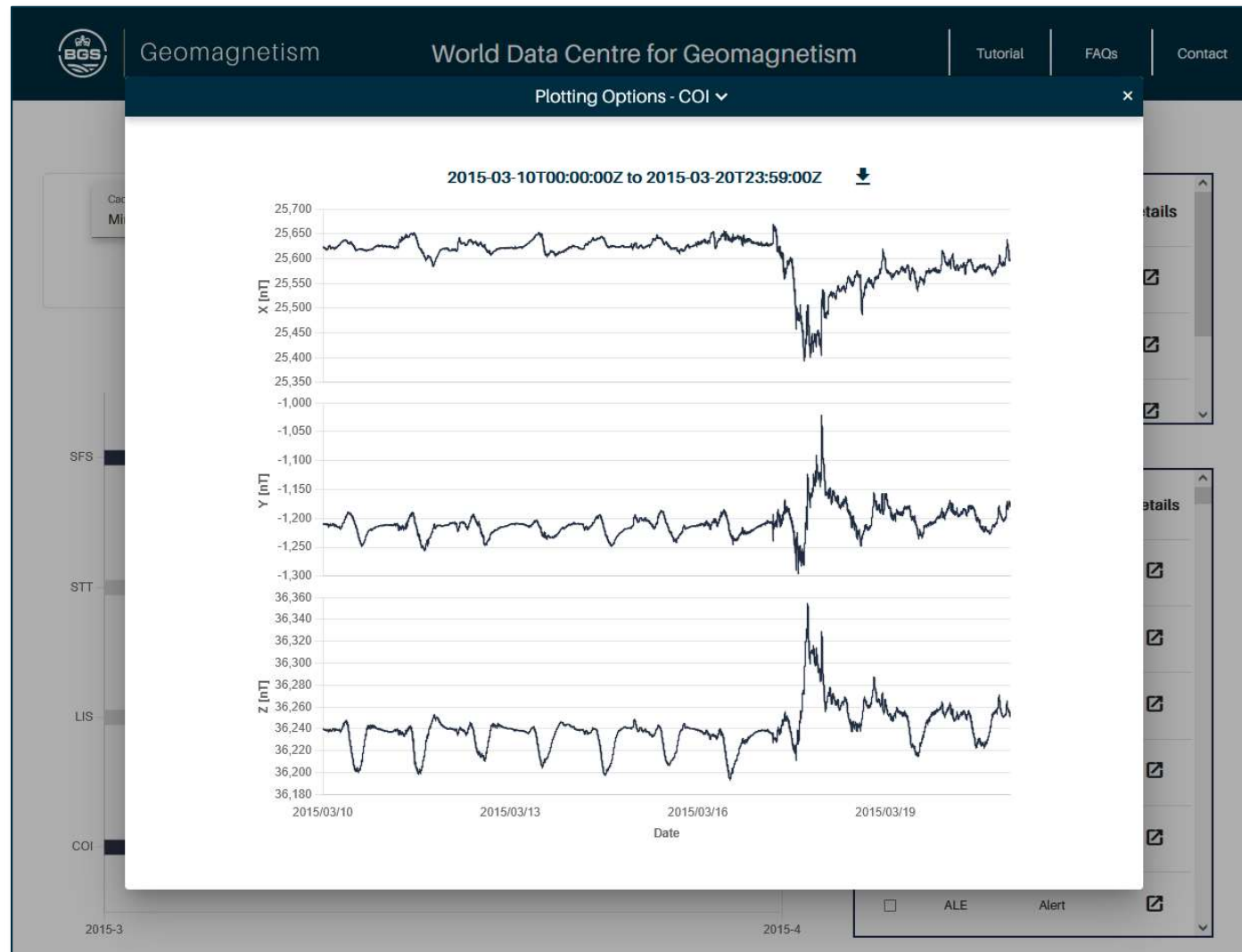
Explore the new portal: [wdc-dataportal.bgs.ac.uk](https://wdc-dataportal.bgs.ac.uk)

## NEW DEVELOPMENTS

# New WDC Portal

### Data plotting and preview

- Users can view the original dataset orientation or convert between XYZ and HDZ.
- Plots can be saved as PNG figures.



Explore the new portal: [wdc-dataportal.bgs.ac.uk](http://wdc-dataportal.bgs.ac.uk)

## NEW DEVELOPMENTS

# New WDC Portal

## Detailed metadata

- Web pages displaying detailed metadata for each observatory are maintained and improved ([wdc.bgs.ac.uk/observatories](http://wdc.bgs.ac.uk/observatories))

## Acknowledgements

- Information about observatory operators is automatically included for all datasets downloaded.

The image displays three overlapping screenshots of the new WDC Portal interface. The top screenshot shows the main portal with a 'Map' tab selected, displaying a map of Europe with observatory locations marked. The middle screenshot shows the 'Coimbra' observatory details page, which includes a map of the observatory location and a table of metadata. The bottom screenshot shows a 'Selected Observatories' list with checkboxes for various observatories.

**Coimbra WDC Observatory Information**

Observatory Details	
Name	Coimbra
IAGA Code	COI
Acknowledgement	Instituto Geofísico, Universidade de Coimbra
Website	Visit

**Selected Observatories**

Observatory <th>Location<th>Details</th></th>	Location <th>Details</th>	Details
<input checked="" type="checkbox"/> LIS	Lisbon	[Details]
<input checked="" type="checkbox"/> STT	San Teotónio	[Details]
<input type="checkbox"/> ADA	Adak	[Details]
<input type="checkbox"/> AAE	Addis Ababa	[Details]
<input type="checkbox"/> AGN	Agincourt	[Details]
<input type="checkbox"/> ALE	Alert	[Details]

Explore the new portal: [wdc-dataportal.bgs.ac.uk](http://wdc-dataportal.bgs.ac.uk)




## NEW DEVELOPMENTS


# New API (application programming interface)

- A standard, language-agnostic interface to APIs which allows humans and computers to discover and understand the capabilities of the service.
- Endpoints include: Data Availability, Data (Zipped & Text), Metadata, Acknowledgements.
- Heliophysics Data Application Programmer's Interface (HAPI) specification capabilities
- Metadata endpoints for INTERMAGNET & EPOS



[WDC Portal](#) | [INTERMAGNET](#) | [EPOS](#)

 [Geomagnetism](#) **WDC Edinburgh API**



**World Data Centre (WDC) API** 1.0.0 OAS 3.1  
[/openapi.json](#)

Here you can find the home of the documentation for the API for the World Data Centre for geomagnetism at Edinburgh, hosted by the British Geological Survey.

Data is available in all standard formats (IAGA-2002, WDC, XML, JSON, CSV) as zipped downloads or as text endpoints.

Metadata for all observatories are also available. The metadata database will be updated soon, ensuring the latest up-to-date results.

**WDC Endpoints**

Observatory Metadata - All Metadata and Contacts	▼
WDC GeoJSONs	▼
Data Availability	▼
Zipped Data	▼
Text Data	▼
Monthly Mean Files in BGS Format	▼
Annual Means Catalogue	▼
Observatory Acknowledgement	▼

API Documentation: [wdcapi.bgs.ac.uk/docs](https://wdcapi.bgs.ac.uk/docs)

## NEW DEVELOPMENTS

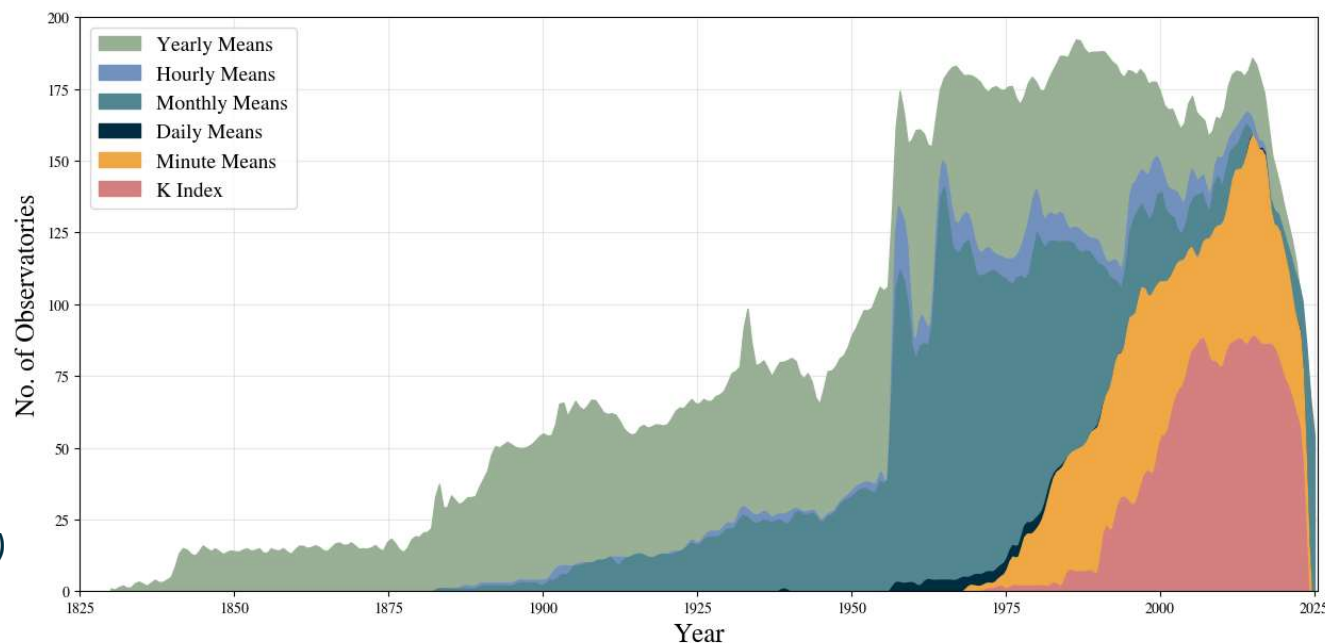
# More data types available

### More data types, and time cadences now available

- Daily Means (*from IAF files*)
- K-Index (*from IAF files*)
- Annual Means - now available from same webservice as other datasets
- Monthly Means (*calculated by BGS [wdc.bgs.ac.uk/monthlymeans/index](http://wdc.bgs.ac.uk/monthlymeans/index)*)

### Future developments

- One-second data
- Improved access to digital yearbooks



*The number of datasets per year available from the WDC Edinburgh for each data type.*

## NEW DEVELOPMENTS

# Core Trust Seal Accreditation

- Certified as a Trustworthy Data Repository by the CoreTrustSeal Standards and Certification Board in February 2025.
- Certification valid for 3 years.
- Demonstrated evidence over 16 requirements which reflect a trustworthy repository.
- CoreTrustSeal certification  
[doi:10.34894/H318RO](https://doi.org/10.34894/H318RO)
- CoreTrustSeal requirements are also revised every 3 years



### CoreTrustSeal Requirements 2023-2025

#### Organizational Infrastructure

- R1 Mission & Scope
- R2 Rights Management
- R3 Continuity of service
- R4 Legal & Ethical
- R5 Governance & Resources
- R6 Expertise & Guidance

#### Digital Object Management

- R7 Provenance and authenticity
- R8 Deposit & Appraisal
- R9 Preservation plan
- R10 Quality Assurance
- R11 Workflows
- R12 Discovery and identification
- R13 Reuse

#### Information Technology & Security

- R14 Storage & Integrity
- R15 Technical infrastructure
- R16 Security

## FUTURE DEVELOPMENTS

# Metadata update tool

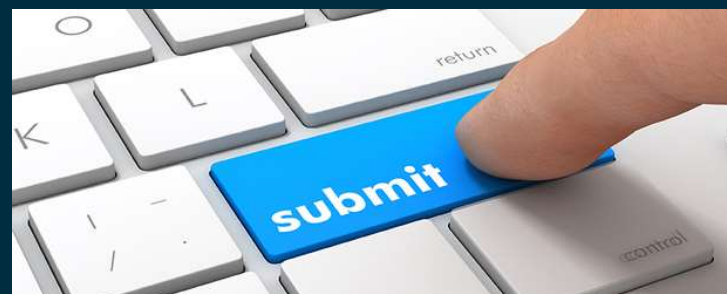
- A new tool is in development for data providers to review and update observatory metadata.
- Tool will support multiple languages.

The screenshot shows the BGS Geomagnetism website with a map of the British Isles and a metadata form. The form is titled 'Edit' and has tabs for Details, Address, Locations, Instruments, Contacts, Intermagnet, and Additional Notes. The 'Instruments' tab is selected, showing a table with the following data:

	Instrument Name	LEMI-025
2	Instrument Type	Non-suspended fluxgate vector magnetometer
3	Absolute	N
4	Primary	Y
5	Orientation	HDZ
	Dynamic Range	70000
	Resolution	0.01
	Sample Period	1
	Serial Number	
	Valid From (DD/MM/YYYY)	2022-01-01T00:00:00
	Valid To (DD/MM/YYYY)	
	Manufacturer	LEMI
	Description	
	Filter	61-point cosine
	Language	English (en)

# Improve data submission?

- Data can currently be submitted by email or writeable FTP
  - FTP will be decommissioned soon
- Develop new tool to enable data providers to submit data online?
  - Provide better guidance on accepted data types and formats
  - Ask data providers to include relevant metadata at point of submission

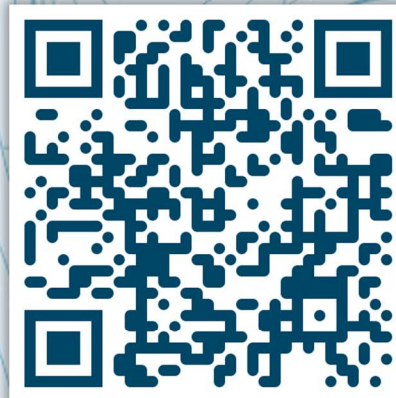




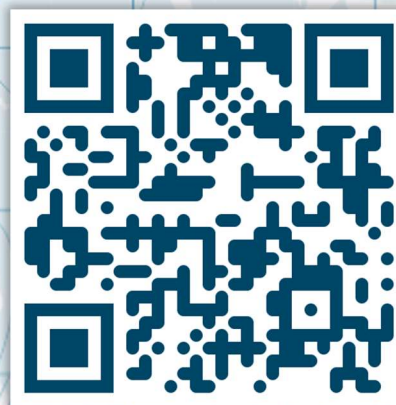
## Conclusion

- New WDC Data Portal and API launched
- Users can now easily search for, plot, and download observatory data
- More data types (K-index, Daily & Monthly means) now available
- WDC has been certified by the CoreTrustSeal as a trustworthy data repository
- A tool to review and update metadata is in development

## Data Portal



[wdc-dataportal.bgs.ac.uk](http://wdc-dataportal.bgs.ac.uk)



## API Documentation

[wdcapi.bgs.ac.uk/docs](http://wdcapi.bgs.ac.uk/docs)

Submit your data: [wdcgeomag@bgs.ac.uk](mailto:wdcgeomag@bgs.ac.uk)