Marine Environmental Data and Information Network (MEDIN)

Data Archive Centre (DAC) Network Annual Report for 2023-24

'Measure once, use many times'

Executive summary

This report represents the continuing efforts of the distributed network of Marine Environmental Data and Information Network (MEDIN) Data Archive Centres (DAC) to underpin MEDIN's overall aim of facilitating access to UK marine data. Whilst the majority of the report's content is derived centrally from information in the MEDIN portal, it is also important to reflect on the achievements against the DAC Work Programme for the year.

All DAC activities were maintained during the past year. There has been continued development of a common Application Programming Interface (API) for the DACs and work has continued on understanding the use of Persistent Identifiers (PIDs) to support a DAC-wide approach to provenance. The coordination of multi-disciplinary data submissions through a single point of contact and triage system to notify all relevant DACs is now being introduced.

The uptake of the CoreTrustSeal accreditation scheme, which provides a globally-recognised framework for the accreditation of data repositories, fully aligned with the MEDIN DAC accreditation process, is continuing to increase across MEDIN DACs. As existing MEDIN accreditation expires, the DACs are preparing submissions to CoreTrustSeal. It should be noted that the review process for CoreTrustSeal is outside the influence of MEDIN and can take a significant time to complete.

We continue to encourage direct access to data and some DACs are continuing to increase both the number, and proportion, of datasets that are accessible within "2-clicks" of finding them on the MEDIN portal. The figures are somewhat distorted due to the wide range of granularity used for MEDIN records. For example, 53% of the MEDIN records originate from UKHO and none of the corresponding datasets are available within 2 clicks of finding them on MEDIN. However, these data *are* accessible online and significant improvements have been made across all the DACs in terms of discoverability and accessibility of data holdings. The DACs continue to provide the foundational infrastructure for the delivery of Findable, Accessible, Interoperable, Reusable (FAIR), open access to UK marine data and in the promotion of best practice in marine data management.

Summary highlights

MEDIN coordinates an operational network of seven linked marine Data Archive Centres (DACs) covering bathymetry; fish and shellfish, fisheries, aquaculture and related samples; the historic environment; marine geology and geophysics; marine species and habitats; marine meteorology; and water column oceanography. The DACs continue to archive data from MEDIN partners and third-party organisations to agreed individual programmes.

This DAC annual report is the final under the MEDIN 2019 to 2024 Business Plan. DAC metrics are now applied more consistently across the DAC network, being pulled directly from the MEDIN Portal, where possible.

The 2023-24 DAC annual reports show that:

- The number of datasets listed in the MEDIN portal with a DOI (Digital Object Identifier) increased by 15%, to 544 in April 2024.
- In 2023/24, 2,198 datasets were added or updated in the MEDIN portal.
- More than 95% of the datasets available from MEDIN DACs are accessible online (an increase of 2,055 since 2021) and 36% are downloadable within 2 clicks of finding them on the MEDIN portal.

1 Introduction

MEDIN has established an operational network of linked marine Data Archive Centres (DACs) to provide secure long-term storage for, and access to, marine data. This network provides the capability for users

to upload and retrieve data. Organisations archiving data at a MEDIN DAC have free access to their data, and DACs manage third-party access to these data according to the data provider's specification.

The required capabilities of DACs within the MEDIN framework are:

- To ensure the secure, long-term curation of key marine data sets, according to best practice and to relevant national and international standards.
- To make available clear, searchable information on their data holdings by the generation and publication of metadata on the MEDIN portal.
- To form the first point of call for expertise in the management of marine data.

In addition, MEDIN will, on request from the data provider, publish metadata records to data.gov.uk and hence the INSPIRE geoportal.

In order to maintain its status as a MEDIN Data Archive Centre, each DAC is required to provide a short annual report so that Sponsors can assess how well the DAC framework is operating.

The MEDIN Sponsors' Board has emphasised the following requirements:

- Provide a statement on funding and sustainability.
- Include Key Performance Indicators (KPIs), specifically measures of use (numbers of enquiries, numbers of downloads).
- Further information on dissemination – how is access to data currently served and how do the DACs see their interaction with the MEDIN portal.

This document provides a report on the current status of DACs in terms of metadata records in the MEDIN Portal where the DAC is custodian of the data, requests from users for data, and financial outlook. This is a summary of information from the individual DAC reports, which are available on request to enquiries@medin.org.uk.

The MEDIN DAC Working Group (WG) continues to provide guidance and strategic oversight of Work Stream 1 activities. The WG promotes inclusive, engaged and proactive ways of working to ensure each DAC has opportunity to contribute and support the objectives.

2 DAC Listing

There are currently seven DACs in the MEDIN DAC network, as listed in

Table 1. More details of each DAC are available through links on the DAC web pages of the MEDIN website at https://www.medin.org.uk/data-archive-centres. These pages include information on the data types held and top-level guidelines on how to submit data to, and access data from, each DAC.

Table 1: MEDIN Data Archive Centres

Name	Coverage	Contact Information	MEDIN Status
British Oceanographic Data Centre (BODC)	Water Column Oceanography data	enquiries@bodc.ac.uk 0782 512 0946	Accredited 2009; Re-accredited 2017; CTS accreditation 2023; operational.
British Geological Survey (BGS)	Marine Geology and Geophysics data	medin@bgs.ac.uk	Accredited 2009; Re-accredited 2017; CTS accreditation 2018; CTS re-accreditation 2022; operational.
The Archive for Marine Species and Habitats Data (DASSH)	Marine Species and Habitats data	Dassh.enquiries@mba.ac.uk 01752 633291	Accredited 2009; Re-accredited 2017; CTS accreditation 2024; operational.
Met Office	Marine Meteorology data	enquiries@metoffice.gov.uk	Accredited Dec 2011; Re-accredited 2018; Accreditation lapsed; operational.
United Kingdom Hydrographic Office (UKHO)	Bathymetry data	CustomerServices@ukho.gov.uk	Accredited 2009; Re-accredited 2017; CTS accreditation 2022; operational.
FishDAC Cefas Marine Directorate, Scottish Government (MDSG) DASSH	Fisheries data - Fish and Shellfish, Aquaculture and related samples and environmental data	Cefas: data.manager@cefas.co.uk	Accredited 2012; Re-accredited 2018; Accreditation lapsed; operational.
		Marine Directorate, Scottish Government: jens.rasmussen@gov.scot	Accredited 2012; Re-accredited 2018; Accreditation lapsed operational.
Historic Environment DAC Archaeology Data Service (ADS) Historic Environment Scotland (HES) Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW)	Marine Historic Environment fieldwork derived data	Archaeology Data Service: help@archaeologydataservice.ac.uk	Accredited 2013; Re-accredited 2018; CTS accreditation 2020; CTS re-accreditation 2024; operational;
		Historic Environment Scotland: peter.mckeague@hes.scot Hannah.smith@hes.scot	Accredited May 2014; CTS accreditation 2021; operational.
		Royal Commission on the Ancient and Historical Monuments of Wales General: Gareth.edwards@rcahmw.gov.uk Maritime: julian.whitewright@rcahmw.gov.uk	Accredited June 2016; CTS Application in progress; Accreditation lapsed operational.

3 DAC Performance

Each year, MEDIN asks the DACs to report on their performance using a standard set of metrics.

The metrics are now pulled directly from the MEDIN Portal where possible. They therefore show the number of metadata records in the portal where a DAC is the custodian of the data. This is not always directly representative of the number of data sets held at a DAC because of some variability in the granularity of metadata records. This is the fifth year of reporting using metrics from the MEDIN Portal.

The key metrics are as follows:

- Total number of metadata records present in the MEDIN Portal where each DAC holds the data. For some cases, particularly the Historical Environment DAC, there are records available in the portal where the DAC is the data holder but did not provide the MEDIN record. In these cases, there has previously been duplication of records and these have been removed this year, leading to an apparent reduction in records for these DACs.
    - A URL leading to online access to data
    - A URL allowing direct access to data (i.e. within 2 clicks)
    - A URL containing a Digital Object Identifier
- Number of requests for data for each DAC (using figures supplied by DACs as it is not possible to obtain this from the MEDIN portal).

3.1 DAC Metrics

The metrics for 2019-20 to 2022-23 are shown in Table 2.

Table 2: Annual metrics for the MEDIN DACs

Year	BGS	BODC	DASSH	UKHO	Met Office	Cefas	MDSG	ADS	HES	RCAHMW
Total number of metadata records where DAC is custodian[1]										
2019-20	857	1107	710	4736	7	2058	282	74	47	26
2020-21	857	1107	723	4736	7	2096	308	263	47	26
2021-22	857	1143	724	6050	7	2108	334	265	26	13
2022-23	936	1144	745	6365	7	2174	351	266	7	1
2023-24	938	1147	759	6610	7	2197	365	270	7	1
New/updated records in reporting year[2]										
2019-20	22	45	496	0	1	536	54	74	25	13
2020-21	693	2	152	0	2	421	54	189	7	1
2021-22	1	1029	118	4600	3	1637	42	259	2	0
2022-23	0	1	45	5865	0	561	28	55	0	0
2023-24	2	7	45	1729	1	389	19	4	2	0
Records with online access to data										
2019-20	855	1056	631	4736	2	1914	240	74	17	0
2020-21	855	1056	635	4736	2	1958	254	153	17	0
2021-22	855	1082	382	6049	2	2108	278	155	9	0
2022-23	936	1083	396	6363	2	2171	299	156	7	1
2023-24	938	1085	415	6608	2	2194	311	160	7	1

[1] These do not include records where the DAC compiled the metadata but is not custodian of the data.

[2] Where number of new records is large compared to total number of records, this normally reflects replacement of records with updated versions

Year	BGS	BODC	DASSH	UKHO	Met Office	Cefas	MDSG	ADS	HES	RCAHMW
Records with 2 clicks to data										
2019-20	694	997	165	0	1	1914	57	73	12	0
2020-21	694	997	124	0	1	1958	64	150	12	0
2021-22	694	1013	178	0	1	2108	69	152	6	0
2022-23	769	1014	191	0	1	2168	81	153	0	0
2023-24	770	1014	218	0	0	2191	87	157	0	0
Records with DOI										
2019-20	0	54	1	0	0	101	49	73	12	0
2020-21	0	54	9	0	0	115	56	150	12	0
2021-22	0	80	15	0	0	115	61	152	6	0
2022-23	0	81	30	0	0	136	72	153	0	0
2023-24	2	81	70	0	0	156	78	157	0	0
Data download requests										
2021-22	2,920,975	540,380	19,889	9,027	Unknown	3,541	39,332	17,284	2	619,043
2022-23	3,934,470	605,620	22,240[3]	471[4]	Unknown	4,609	80,804	18,651	2[5]	731,100
2023-24	1,616,073	469,995	37,039	506	Unknown	4,712	130,158	16,565	5	538,200

Please note that it is not advisable to compare absolute values between DACs, as the granularity of the metadata records varies significantly between (and even within) DACs. For instance, all the data held in the Met Office MEDIN DAC for marine meteorology data are held within 7 data sets, which are augmented each year with that year's new data and their associated metadata records updated accordingly.

[4] DASSH recorded 14,827 dataset downloads over 2022/3 period. However, due to internal recording issues, data are missing for 4/12 months. Accounting for these missing months, the estimate for the period is 22,240 data requests

[4] In 2022/3 requests were based on users that entered the order page, 2021/2 requests were based on user selected downloads from the bathymetry and seabed mapping apps.

[6] Most are self-serve from the website

Figure 1: Number of metadata records in the MEDIN portal per DAC.

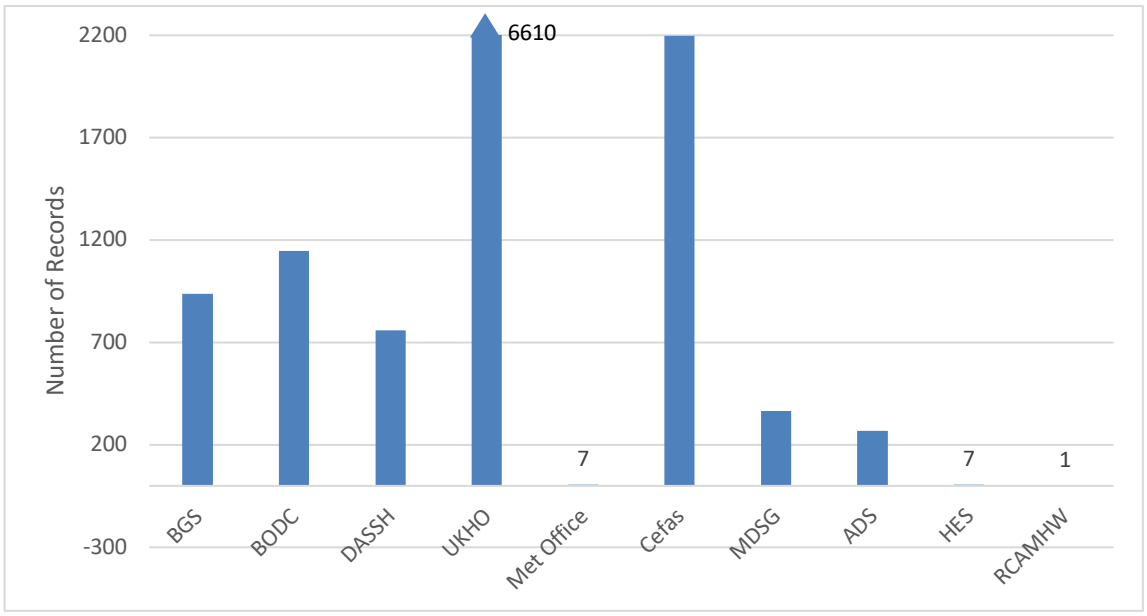


Figure 1 shows that the UKHO remains the DAC with the most metadata records in the MEDIN Portal, accounting for more than 53% of the total. However, as noted earlier, the difference in metadata granularity between DACs means a direct comparison between DACs is not appropriate (as noted above for the Met Office). Historic Environment Scotland have updated or increased their metadata records in the MEDIN portal by over 29% in the past year, closely followed by the UKHO at 26% (Figure 2). Some of this will relate to new datasets, or new data added to existing datasets such as time series, and some to improving the quality of existing metadata. Note that any updates to existing metadata records count as changes in this metric.

Figure 2: Percentage of metadata records in the MEDIN portal per DAC that are new, or were updated, during 2023-24.

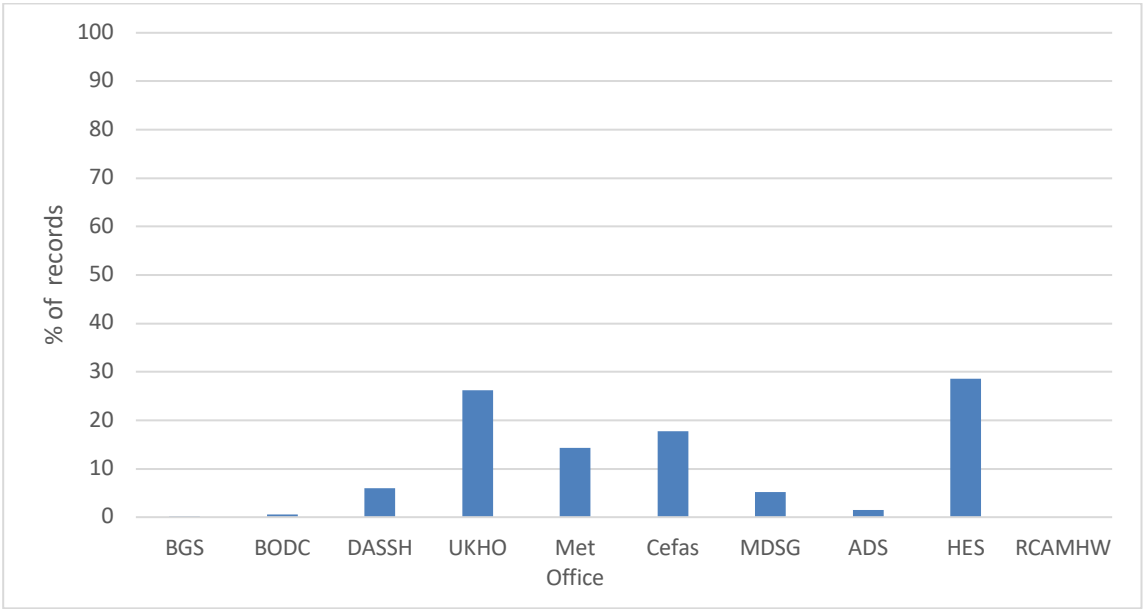


Figure 3 shows that seven MEDIN DACs have a Uniform Resource Locator (URL) leading to some form of online access to data (not necessarily 2-click access) for over 85% of the metadata records for data

they hold. In total this represents more than 95% of all metadata records from DACs in the portal. One way to provide direct access to data is by using a Digital Object Identifier (DOI) and the use of DOIs has increased by 15% this year, although the proportion of records with a DOI has remained stable (Figure 4).

Figure 3: Percentage of metadata records per DAC in the MEDIN Portal with online access to data.

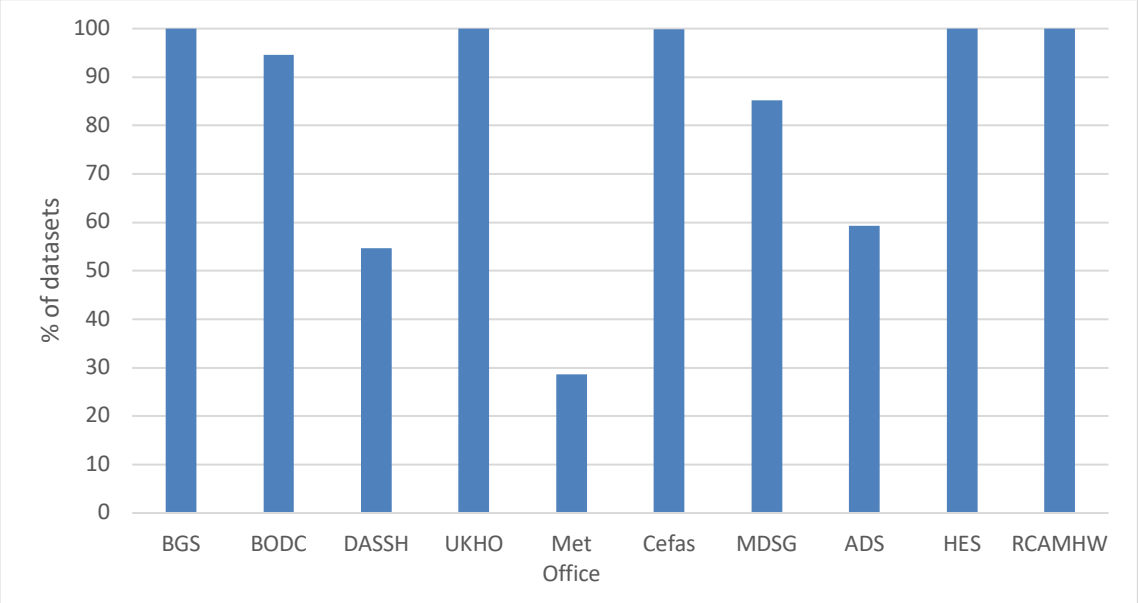
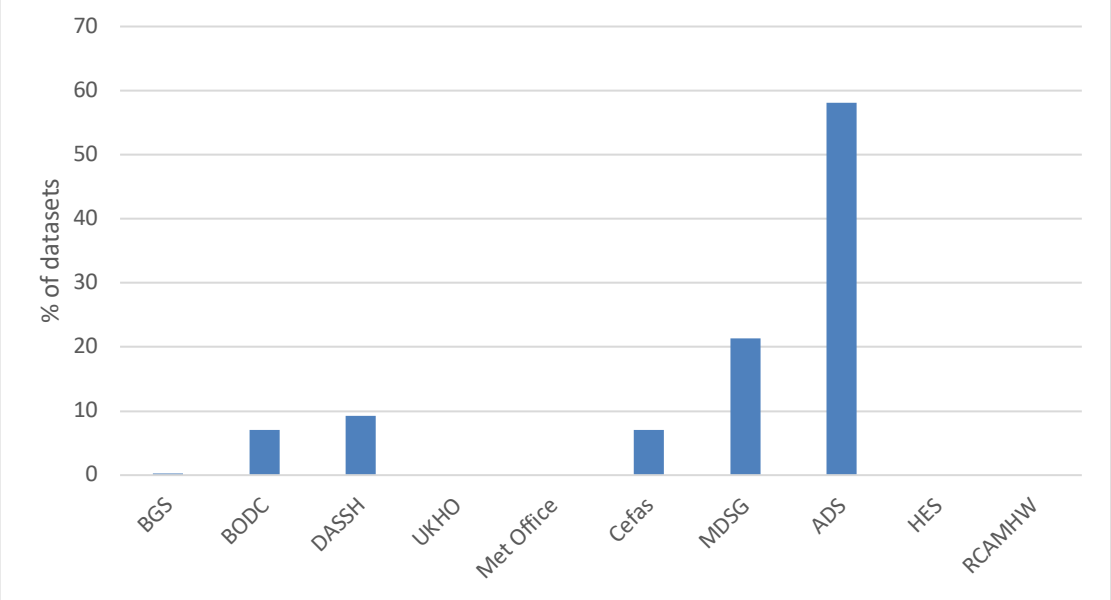
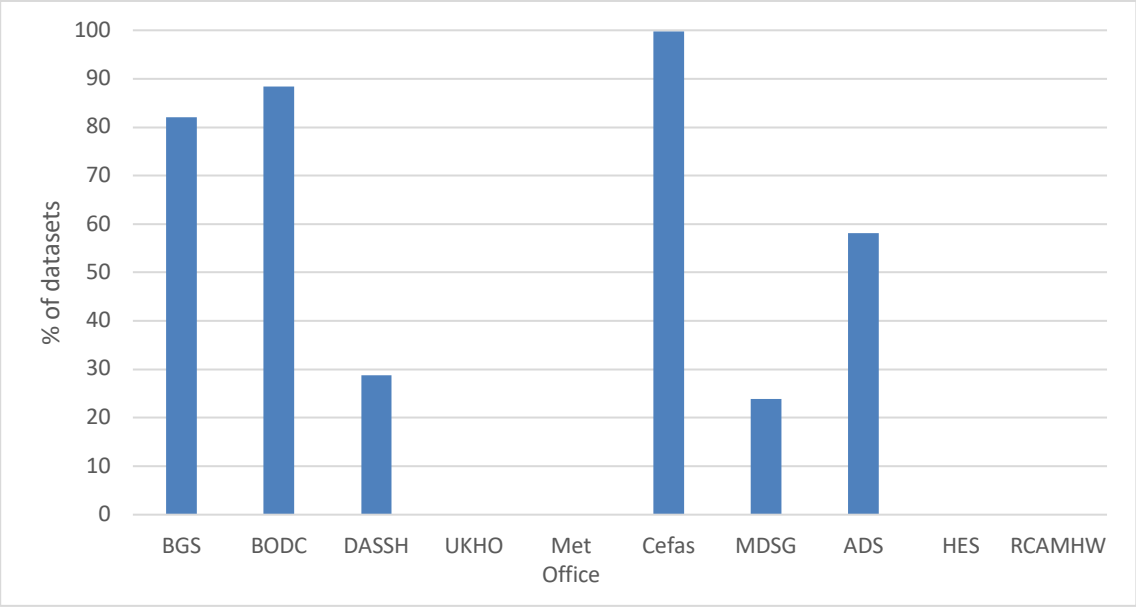


Figure 4: Percentage of metadata records per DAC in the MEDIN Portal with a Digital Object Identifier (DOI).



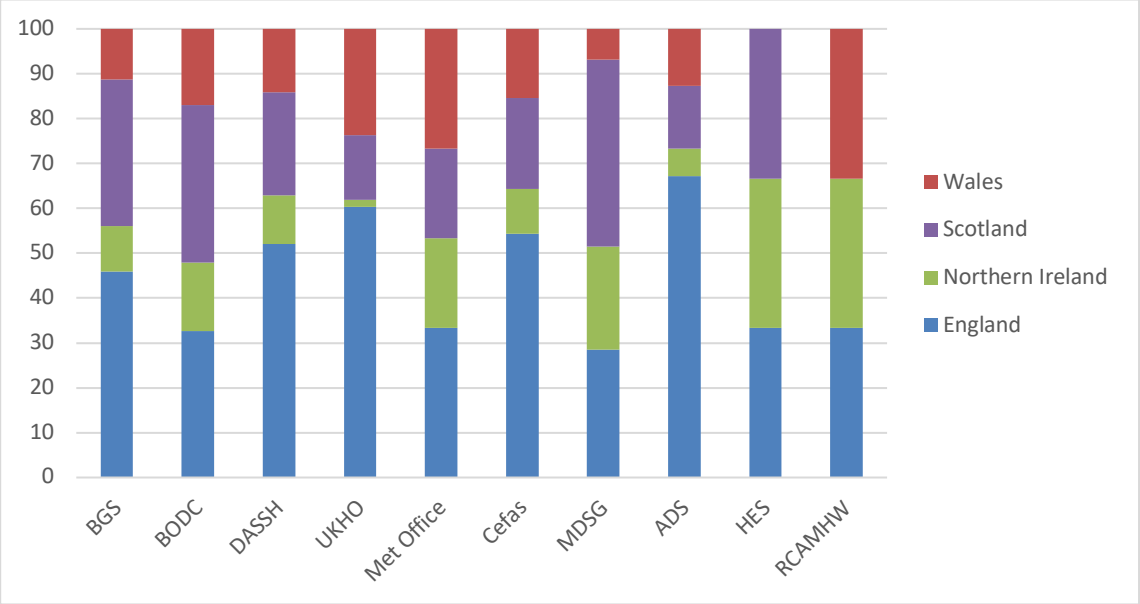
MEDIN continues to promote direct access to data, ideally within 2 clicks. The DACs are continuing to increase the number of metadata records providing data with '2-click' direct access, although the proportion of records remains similar to 2022-23 as new records are not all associated with 2-click download options. Three of the MEDIN DACs now provide direct access to data (within 2 clicks) from over 80% of their metadata records in the portal (Figure 5).

Figure 5: Percentage of metadata records per DAC in MEDIN Portal that offer 2-clicks to data.



The percentage breakdown of metadata records which originate in the UK, and are available in the MEDIN portal, by country of origin, where the DACs are custodian, is shown in Figure 6.

Figure 6: Percentage of metadata records, originating in the UK, per DAC in the MEDIN Portal, broken down by country of origin.



3.2 New datasets

The MEDIN DACs continue to archive major new datasets. Table 3 summarises new datasets archived by each DAC during the financial year (FY) 2023-24.

Table 3: Summary of new datasets archived at MEDIN DACs during 2023-24.

Met Office	**UKHO**
There are seven datasets on the MEDIN portal, which together describe most *in-situ* marine meteorological observations collected by the Met Office. The Met Office differs from other DACs in that it doesn't add new data sets, instead it adds new observations to its existing data sets. The amount of data in the database increases daily.	• 325 surveys added since May • 6478 surveys available to download
DASSH	**BODC**
• The Shore Thing series contained 20,000 records compiled through a citizen science initiative working with schools and community groups around the British Isles. The collection contains information on rocky sea-shore life responding to climate change between 2001 and 2019. • eDNA dataset is 'A 17-year time-series of fungal environmental DNA from a coastal marine ecosystem reveals long-term seasonal-scale and inter-annual diversity patterns'. This is the first eDNA data to be ingested by DASSH and made viewable on the DASSH mapper.	During 2023/24, BODC received 161 accessions of data from 30 organisations in 9 countries as follows: • 109 accessions from charitable organisations (including the National Oceanography Centre (NOC)) • 5 accessions from Natural Environment Research Council (NERC) laboratories (not including collaborative centres and NOC) • 28 accessions from UK universities • 19 accessions from overseas laboratories The data comprise physical, chemical, biological and geophysical observations in a variety of forms including profiles, time series and discrete samples. During 2023 - 2024, an additional 74 datasets received a DOI. A new version of the GEOTRACES project IDP (Intermediate Data Product) dataset was released, facilitating a new formal publication for a well-recognised and established global community.
RCAHMW (Historic Environment DAC)	**ADS (Historic Environment DAC)**
During 2023/2024, 52 datasets relating to a 3D digital survey (primarily photogrammetry-based) of maritime sites located in the intertidal zone, or adjacent coastal zone were archived. This includes data relating to sites surveyed during 2022, but which could not be archived straight away. These are derived from the RCAHMWs own maritime survey programme and represent a major development in the baseline record afforded to these sites.	• Digital Archive from a GPS survey of the foreshore tidescape at Sandwich Bay, Kent 2018-2022 https://doi.org/10.5284/1118187 • Digital Archive from a coastal erosion survey of the Tobacco Cliffs, Formby Beach, Sefton, Merseyside 2015-2022 https://doi.org/10.5284/1118188 • Both archives are from a community-led projects (CiTIZAN), which are often under-represented in the digital record held by the ADS. https://doi.org/10.5284/1116860 • Digital Archive for Hornsea Offshore Wind Farm Project One (HOW01) 2015-2019 The compilation of seven excavations from along the line of the cable corridor for Hornsea Project One. This is the first time that a digital archive from mitigation works for wind farms has been deposited with the ADS.
HES (Historic Environment DAC)	**BGS**
• 23 wreck sites (20 Orkney) • 176 events added • 190 items relating to 57 maritime sites catalogued (165 images from survey of HMS Unicorn)	Further Civil Hydrography Programme backscatter and sample data received from UKHO.

Marine Directorate, Scottish Government (FishDAC)	Cefas (FishDAC)
• 3 anglerfish surveys • 2 North Sea International Bottom Trawl Surveys (Quarter 1 and 3) • 2 West Coast Bottom Trawl Surveys (Quarter 1 and 4) • West of Scotland Deepwater Trawl Survey 2023 • CodSELect project data (surveys and fish behaviour tank experiments) • Nephrops Underwater TV Surveys for 2021 and 2022 • Scottish Scallop surveys 2022+2023 • Herring Acoustic Survey • Gear Comparison survey • West of Scotland acoustic sprat survey • Rockall Haddock survey	• Hull et al (2023). WaveNet near real-time data feed - from the past 48 hours. Cefas, UK. V1 https://doi.org/10.14466/CefasDataHub.142 This is the first near real time data service which Cefas have published via our Data Portal. A major user of this service is the Copernicus Marine Service In-situ Thematic Assembly Centre which uses this data to support the marine forecasting and analysis services. • Couce and Thompson (2023). Modelled projections of habitat for fish species feeding guilds around North-western Europe under climate change, 2010 to 2095. Cefas, UK. V1. https://doi.org/10.14466/CefasDataHub.139 These data are central to the scientific article which won Cefas' publication of the year award, 'Climate change affects the distribution of diversity across marine food webs' which is the first study which demonstrates real evidence for decreased species richness and changes to the marine food web that is a result of climate change. • Bluemel et al (2023). Seahorse species predicted habitat distributions and associated environmental data layers. Cefas, UK. V1. https://doi.org/10.14466/CefasDataHub.143 The publication of this data will support marine spatial planning to reduce the broader impact of anthropogenic activities and enable better decision-making to protect these sensitive species and their habitats.

4 Highlights

In addition to providing metrics, the DAC reports also detail highlights from the previous year, which together show levels of activity and examples of usefulness of the DAC network and also indicate how nationally and internationally integrated the DAC system is. A number of new developments and initiatives took place during 2023-24, enhancing the capability of the MEDIN DACs to the benefit of MEDIN's users.

4.1 New developments and capabilities:

Marine Species and Habitats DAC (DASSH): Core Trust Seal accreditation was successfully gained by DASSH.

New online "How to..." videos showing users how to submit data and how to search for data.

eDNA data are now available to view and download via the DASSH mapper. Polygon data are also now viewable on the DASSH mapper

Bathymetry DAC (UKHO): Rolling out of the UKHO Data Upload Portal allowing users to submit bathymetry data to the UKHO with all the correct metadata required for MEDIN standards, resulting in users no longer being required to email the UKHO with large datasets. The metadata is in dropdowns to allow users to select the correct attributes.

Fisheries DAC (MDSG and Cefas)

MDSG: An upgrade to the existing data portal is in progress but has not been completed or deployed yet.

Cefas: Three new metadata templates were launched during 2023-24 for Cefas staff users of the Cefas Data Catalogue (Master Data Register MDR system), which allows users to efficiently and accurately create and update their metadata records.

- Internal Metadata – this template allows Cefas users to quickly create basic metadata to internal purposes only/or initially.
- External Spatial Metadata – this template allows Cefas users to create metadata which is fully complaint with the MEDIN 3.1.2 Discovery Metadata Standard. The new version includes more use of drop-down lists and simplified keyword selections from the Standard, to improve ease of use and increase consistency within our metadata records.
- External Non-Spatial Metadata – this allows users to create records for non-spatial data which complies with all non-spatial elements within the current MEDIN Discovery Standard but excludes spatial fields which are not relevant.

Historic Environment DAC (RCAHMW, ADS, HES):

RCAHMW: In response to the climate emergency, in 2022 a formal rolling programme of digital survey of historic assets located in the inter-tidal zone and coastal margin was started. In time, this will feed through to enhanced/upgraded records of maritime sites most at risk from the impact of climate change.

A major overhaul of wreck data held within the National Monuments Record of Wales (NMRW) has taken place during 2023/24 and will continue in 2024/25. This has focussed on using analysis undertaken in the "Echoes from the Deep" project undertaken by Dr Innes McCartney and Bangor University. That work has corrected over 150 errors in wreck identification in the Irish Sea and provides updated survey information for over 250 wrecks. Information from the Echoes from the Deep project is being incorporated into NMRW wreck metadata as an ongoing piece of work.

ADS: The web pages for delivery of data have been redesigned to meet modern accessibility requirements. This work has also incorporated a reworking of collection metadata pages to better meet the FAIR guidelines.

HES: The UKRI (UK Research and Innovation) TaNC Unpath'd Waters project - Historic England's UKRI Toward a National Collection (TaNC) Unpath: To unpath'd waters, undream'd shores, is making great progress on bringing together experts from across the marine heritage sector in the UK. HES has been working on the maritime craft terminologies with colleagues in the national heritage agencies from Historic England, RCAHMW, Northern Ireland and the Isle of Man as well as with the National Maritime Museum and Lloyds Register Foundation to develop a consistent approach to indexing maritime craft in national datasets prior to the publication of a virtual marine record for the UK (launched 23 April 2023).

Water Column Oceanography DAC (BODC): BODC became CoreTrustSeal accredited in October 2023 supporting BODC's role as a MEDIN DAC, IODE (International Oceanographic Data and Information Exchange) NODC (National Oceanographic Data Centre) and in the NERC Environmental Data Service (EDS).

BODC have successfully supported the Scottish Association for Marine Science (SAMS) in installing and running an app to facilitate glider data submissions. BODC also have the new capability to deliver data from the CT55 Argo BGC (Biogeochemical) floats in continued support of the Argo programme, using new technologies.

BODC have worked on a pilot exposure of data assets to Ocean InfoHub, a global project under IOC-IODE. This work is potentially key in informing other data centres on how to align with Ocean InfoHub and thus the wider Ocean Data and Information System (ODIS) architecture, which is a key asset under IOC-IODE and a core IODE contribution to the UN Decade. This work was also an opportunity for the UK to contribute to the further evolution of the ODIS architecture, which will benefit the broader global

community. It also complements the work MEDIN did to submit all MEDIN metadata to Ocean InfoHub. Further work is planned within BODC to operationalise this proof of concept.

BODC have been involved in the delivery of quality management training to IODE representatives as part of the Ocean Teacher Global Academy (OTGA).

BODC repaired the data flow of Seal Tag data unblocking a data flow for the Met Office.

BODC has a new metadata capture application, which is a new location to input metadata for the deployment of autonomous platforms, in addition to lodging new registrations for instrument models, instances and sensors.

The General Bathymetric Chart of the Oceans (GEBCO) multi-resolution sub-setting prototypes have been completed with further development ongoing with community feedback.

A new ERDDAP (Environmental Research Division Data Access Program) UI (User Interface) has been developed. This is the first part in making data more easily accessible to wider data users with a more friendly and interactive interface rather than the more complicated interface required for technical development. This work will support ongoing developments to use ERDDAP as a mechanism for delivering data and meeting FAIR principles. The new user interface is here: https://linkedsystems.uk/dataportal/.

BODC have been working on an upgrade to their data submission application, consolidating the initial build, improving the user experience and interface with new features in the front and back end in preparation for new technologies.

An EDS citation metric API allowing the NERC EDS to provide data providers and users with citation metrics on DOIs (https://www.bodc.ac.uk/eds-citation/docs#/) has been created. More work is needed across the data infrastructure, and BODC is involved in both the AGU (American Geophysical Union) and RDA (Research Data Alliance) complex citation work.

Marine Geology and Geophysics DAC (BGS): Ongoing improvements/additions to the Offshore GeoIndex:

- OGC API (Open Geospatial Consortium Application Programming Interface) - addition of Gravity and Magnetic data layers – improves access to data which were previously available under licence
- AGS API (Association of Geotechnical and Geoenvironmental Specialists Application Programming Interface) improvements - improves access to data for users.
- MEDIN metadata subportal is live and now has a CSW and OGC API-Records endpoint for the MEDIN collection. (https://metadata.bgs.ac.uk/geonetwork/medindatacatalogue/eng/catalog.search#/home)
- There will be a Metadata editor project during 2024/25, which will include improvements to the metadata export to GN workflow - this should include upgrading BGS records to the latest versions of the Gemini and MEDIN discovery metadata standard (depending on budget).

Marine Meteorology DAC (Met Office): Improved ingestion process for inserting historical data into the datasets, DAC staff can now manually ingest rather than relying on automatic ingestion runs, vastly increasing the volumes which can be processed.

There has been continued improvement of the PowerBI reporting to aid in quality control work and generation of reports.

4.2 New funding streams

Some of the MEDIN DACs received new funding streams during 2023-2024.

The Marine Species and Habitats DAC (DASSH) has received funding through DTO (Digital Twin of the Ocean) BioFlow. The primary objective of the DTO BioFlow Project is to awaken sleeping biodiversity

data, enabling a smooth integration of both existing and new data into the EU Digital Twin Ocean. In addition to being the MEDIN DAC, DASSH are also the UK node for OBIS providing marine biodiversity data from the UK to global (OBIS) and European (EMODnet) repositories.

DASSH have a partnership with Natural England (NE), funded by the Department for Environment, Food and Rural Affairs (Defra), through the Natural Capital and Ecosystem Assessment (NCEA) programme, building an online accessible tool on data guidance for citizen science projects.

A new funding stream has been obtained for the NE Citizen Science Tool, which provides data guidance that can broaden the participation in environmental monitoring, maximise the efficacy of volunteers in citizen science projects so they can contribute good quality marine evidence which is FAIR. https://www.dassh.ac.uk/citizen-science/best-practice

Water Column Oceanography DAC (BODC), like DASSH, has secured funding through the DTO-BioFlow project to create a pipeline to OBIS to expose marine biodiversity (monitoring) data.

LandSeaLOT is a funded project that provides an opportunity to hone training/consultancy skills in cross domain (terrestrial-marine) semantic interoperability.

The FAIR-IMPACT FAIRness assessment challenge is a project to upskill in FAIR assessment tools, an opportunity to experiment with OntoPortal, and an opportunity to put the NERC Vocab Server (NVS) through a FAIRness assessment test.

The AMRIT project is looking at working on the next generation of data processing systems for Argo, Gliders, OceanSITES, ICOS, Go-Ship etc.

Funding has also been obtained through the UKRI Digital research infrastructure programme. In addition, the UKRI Research Cloud Pilot provides funding to build tools for PIDs and citations.

Marine Geology and Geophysics DAC (BGS): The Marine Data Exchange geotechnical data standardisation, is a collaborative project with The Crown Estate to review their geotechnical data holdings with a view to improving standardisation.

Historic Environment DAC (RCAHMW, ADS, HES):
ADS: The ATRIUM project, awarded through HORIZON Research and Innovation Action, is a four-year project is led by DARIAH (Digital Research Infrastructure for the Arts and Humanities) and has 29 different partners and affiliates from 14 European countries. The project will develop tools to provide improved data access to a wide array of essential text, image and sound-based services that cover all phases of the research data lifecycle. This project has allowed ADS to recruit a Data Engineer to oversee improvements in the exchange of metadata, improving to external partners and services (including MEDIN).

SHADE (Sharing Heritage and Archaeological Data Effectively) is a COST Innovation Grant (CIG) funded project that seeks to provide a sustainable model for the ARIADNE Research Infrastructure (RI) and facilitate access for individuals and organisations to publish their data online. SHADE is a follow-on action resulting from the work of the SEADDA (Saving European Archaeology from the Digital Dark Age) Cost Action.

4.3 International meetings

Many of the DACs have a strong presence internationally, reflected in the broad spectrum of international meetings attended. Most international meetings have been held virtually during this period. A few examples from this reporting year include:

A variety of EMODnet meetings (e.g. Biology, Chemistry, Geology, Ingestion, Partners meetings) involving **Marine Species and Habitats DAC (DASSH)**, **Water Column Oceanography DAC (BODC)**, **Marine Geology and Geophysics DAC (BGS)** and the **Fisheries DAC (Cefas)**

A number of International Council for the Exploration of the Sea (ICES) meetings and working groups were attended by the **Fisheries DAC (MDSG and Cefas)** and the **Water Column Oceanography DAC (BODC)**.

The **Marine Species and Habitats DAC (DASSH)** attended the OBIS Steering Group, the GOOS Bio Eco Panel, the DTO Bioflow Kick-off meeting and the MarcoBolo General Assembly.

The **ADS (Historic Environment DAC):** attended a number of Saving European Archaeology from a Digital Dark Age (SEADDA) workshops, the European Association for Archaeology (EAA) Conference 2023, Computing Applications and Archaeology (CAA) 2024 and the Society of American Archaeology Conference (SAA). Kick-off meetings for Sharing Heritage and Archaeological Data Effectively (SHADE) and Advancing FronTier Research In the Arts and hUManities (ATRIUM) were also attended, and a meeting was held with the British International Research Institutes (BIRI).

The **HES (Historic Environment DAC), ADS (Historic Environment DAC) and MEDIN** led a session at the Computer Applications In Archaeology, on An inventory of the Sea: our shared marine heritage challenges and opportunities

The **HES (Historic Environment DAC)** attended Project Tangaroa: Potentially Polluting Wrecks: The Governance & Regulatory Framework for PPWs.

The **Marine Geology and Geophysics DAC (BGS)** attended the Coordination and Support Action Geological Service for Europe (CSA-GSEU) meetings.

Marine Meteorology DAC (Met Office) attended the E-Surfmar Annual Meeting and the Ship Observations Team (SOT) meeting.

Bathymetry DAC (UKHO) attended a GEBCO meeting

The Fisheries DAC (Cefas) attended OSPAR (including EIHA, ICG-Noise and ICG-QSR) and various IODE meetings.

The **Water Column Oceanography DAC (BODC)** attended the GEBCO/TSCOM: Developing a Vision for Improving the Discovery and Access of Bathymetric Data meeting, the Seabed 2030 South & West Pacific Regional Mapping collaboration event, the RDA International Data week, Blue-Cloud 2026 2nd General Assembly International Digital Curation Conference (IDCC), KubeCon and CNCFCon, the PLOCAN Glider School, FAIREASE winter school and WMO Virtual Workshop on Environmental Sustainability of Observing Systems and Methods. Various project meetings were attended, including GEOTRACES and Argo and an online meeting on Roaring into the future: Meeting on Research Organisation Registry workshop.

4.4 Data Access and Sharing

Data from most of the MEDIN DACs are made available under open licences such as the UK Open Government Licence (OGL) for data. Most data from MDSG, NERC (e.g. BGS and BODC), Met Office and Cefas are made available under this licence. UKHO data are made available under the UKHO Bathymetry Data Licence, which allows users (with caveats) to copy, publish, distribute and transmit the information; adapt it or exploit it commercially, for example, by combining it with other Information or by including it in their own product or application. For data centres accepting data from non-government or Research Council sources, there may be additional constraints applied to the license agreements.

DASSH licensing is assigned in consultation with the data provider. All data are made “as open as possible, as closed as necessary”. DASSH promote CC-BY or OGL as the preferred license but in some cases, data are deposited under CC-BY-NC, restricting reuse to non-commercial purposes.

The DACs’ data access mechanisms are described below, along with improvements made during the reporting year:

Bathymetry DAC (UKHO): Data sets are accessible from the UKHO via the Seabed Mapping Service at https://seabed.admiralty.co.uk, which provides a geospatial viewer and search query, supported by complete MEDIN 3.1 metadata records completed this year. The MEDIN 3.1 metadata is also available from the UKHO web-accessible folder – https://medinexport-data.ukho.gov.uk/

The UKHO 100m Web Map Service (WMS) is a simple HTTP interface for requesting georeferenced map images of the seabed around the UK derived from over 5,000 open bathymetric data sets, which have been conflated into a single 100m resolution gridded surface.

The data are licenced under OGL and are also made available through third-party portals such as data.gov.uk, EMODnet and the International Hydrographic Office (IHO) Data Centre for Digital Bathymetry (DCDB). Data sets can also be requested from the UKHO via Customer Services.

Marine Species and Habitats DAC (DASSH): Data sets are ingested into DBOSSH, the internal DASSH database, converted to Darwin Core format and then published on the IPT (Integrated Publishing Toolkit) for EMODnet (European Marine Observation and Data Network) and EurOBIS/OBIS (Europe/ Ocean Biodiversity Information System) to download and publish/collate. Data sets are also shared regularly with NBN (National Biodiversity Network). On a DASSH level, individual species records are made available on the DASSH Mapper (https://www.dassh.ac.uk/data/search-data, this URL will change with the new MBA website launch), and whole datasets are made available through MEDIN Discovery Metadata published on the MEDIN portal, where a download link to the geoserver hosting the dataset will be provided in the resource locator.

Over the last year, back-end optimisation of databases has been undertaken to increase the query response time, as well as the publication of “How to” videos to improve the user experience.

Fisheries DAC (Cefas and MDSG):

MDSG: For repeated annual surveys coordinated internationally through ICES working groups, the data are submitted to the ICES Database for Trawl Surveys (DATRAS), while metadata is sent to MEDIN with direct links to the DATRAS system. For nationally coordinated surveys or other datasets, data are uploaded to the Marine Directorate, Scottish Government Open Data portal and made available with a DOI. Metadata containing the DOI are submitted to MEDIN.

Over the last year the MDSG has increased the number of datasets available online, as well as increasing the number of datasets with DOI.

Cefas: Metadata and datasets are made available via the Cefas Data Portal, with no registration or sign-in required. All data can be downloaded from the website in csv or shapefile format, additional spatial data is available via WMS/WFS direct feeds. Public APIs are available to access all metadata and data.

Following Cefas Data Management Policy, data are made openly available on the Cefas Data Portal by default, except where there is a good reason to restrict e.g. commercially sensitive or personal data.

All *metadata* is automatically exported to MEDIN and data.gov.uk via Web Accessible Folders (WAFs) and all metadata that include a DOI are also served to the Defra Shared Services Platform. Such third-party data portals direct external users directly to the Cefas Data Portal to access the data. Selected biodiversity timeseries data sets are published on the Cefas Data Portal and distributed by DASSH to the EurOBIS/OBIS data systems, which are in turn made accessible via the GBIF and EMODnet data portals. Data submissions are also provided to and accessible via ICES including ICES Database on Trawl Surveys (DATRAS) meeting national commitments.

Over the last year CEFAS have been working on improving the user experience in the creation and curation of metadata records via new templates, which will ultimately improve data access via improved quality and volume of published discovery metadata records alongside associated datasets.

Historical Environment DAC (ADS, HES and RCAHMW):

ADS: Data sets are available for download directly from the ADS website. Data sets are normally grouped by collections that reflect the project carried out by the originator, such as a survey or monitoring project. Each collection has a DOI. Grey literature reports are disseminated as individual records within an application known as the ADS Library. Each report has its own DOI.

Data are available through the following portals: Unpath, ARIADNE, Keepers Registry, Heritage Gateway and the NERC Data Catalogue.

Over the last year, web pages where data is accessed by an end-user have been reworked. The pages now meet modern accessibility requirements, and metadata is presented to better meet FAIR guidelines

HES: Public access is provided through the online portal (Canmore) and map-based search (PastMap). Users may select and download up to 1,000 records in .csv or .kml formats under an Open Government Licence.

HES Public Services are the principal point of contact for bespoke data requests and downloads. They do not distinguish between terrestrial and marine data requests. Seven marine data requests were forwarded to the Data Management team.

HES spatial datasets and services: Historic Marine Protected Areas, Scheduled Monuments (for Inter-tidal and wrecks), Listed Buildings (for Coastal built heritage) and Canmore – National Record of the Historic Environment, are available to download and access as view and download services from the HES spatial downloads page and through the Scottish Government metadata portal. Records are harvested to data.gov.uk but, following Brexit, no longer appear on the INSPIRE Geoportal. Data are also provided through Marine Directorate, Scottish Government's National Marine Plan Interactive Portal and through SEWeb. A copy of the Canmore record is provided periodically to the ADS for uploading onto ArchSearch and for onward use in the ARIADNEplus portal.

RCAHMW: Data are mainly accessed via the dedicated Coflein online database, which is OGC compliant, and through Historic Wales, the collaborative historic environment portal for Wales. The Coflein data access system is published using ArcGIS Online with compliant metadata standards. The full maritime dataset is available on the Welsh Government's 'Data Map Wales', which is being upgraded in 2023. Data downloads are available on request to the RCAHMW enquiry service and archives can be accessed in a public reading room. A growing selection of our digital maritime surveys are also disseminated to the public in the form of a 3D model, freely available to view, through the SketchFab portal.

Over the last year, maritime data has been fully disseminated through DataMapWales, including aspects such as bi-lingual fields.

Water Column Oceanography DAC (BODC): The BODC National Oceanographic Database (NODB) delivery system (https://www.bodc.ac.uk/data/online_delivery/nodb/) now gives access to 152,000 data series, a 2% increase in the number of series available online last year. Data are available in a fashion that allow users to search across cruises, time, location, originator, parameter *etc.*. Services offer users the choice of a one-click download (for publicly accessible data) or 'online shopping' with a basket and checkout mechanism. Data are available in various data formats under secure access control methodologies, which includes user request tracking of auto-downloads.

The BODC tally sits at 268 data collection aggregations and 835 cruise collection aggregations. Where appropriate, these discovery metadata records carry a URL within the online resource metadata that leads directly to the data. The URLs are of two types:

- If a dataset has an associated DOI, the URL resolves to a landing page within the BODC Published Data Library that incorporates a one-click download service.
- For non-DOI datasets, a URL resolves to a pre-filtered search result set in the BODC online web user interface (UI) specific to the data or cruise collection. The UI incorporates a one-click download service.

BODC have made further improvements to access arrangements through continued development of ERDDAP instances, sensor web enablement schema and Google's schema.org. All metadata records in the PDL have been published with schema.org. These improvements are ongoing pieces of work within BODC, who will continue to provide improvements to DOI/PID services.

Data are made available through a number of international third-party portals including: SeaDataNet CDI; SeaDataCloud; EMODNET Chemistry via SeaDataNet; ICES; Marine Directorate, Scottish Government (MDSG) and CEFAS (MERMAN data assessment level cleaned data); GEBCO; ARGO GDAC; Everyone's Glider Observatory (EGO); Global Sea Level Observing System (GLOSS); Global Ocean Acidification Observing Network (GOA-ON).

Over the last year, BODC have worked on a pilot exposure of data assets to Ocean InfoHub. This work is potentially key in informing other data centres on how to align with Ocean InfoHub and thus the wider ODIS architecture, which is a key asset under IOC-IODE and a core IODE contribution to the UN Decade. This work was also an opportunity for the UK to contribute to the further evolution of the ODIS architecture, which will benefit the broader global community. Access to sample data via ERDDAP is also being worked on.

Marine Geology and Geophysics DAC (BGS): Data are made available through several portals:

- OGC API
- The Offshore GeoIndex (also available as a Web Map Service)
- Offshore GeoIndex Web Map Service
- Offshore Products Web Map Service
- SEA Data Portal
- BGS Deposited Data Search

Additional services provide access to the DAC holdings:

- Geological maps created from data are incorporated into EMODnet map products and made available through the EMODnet Geology Portal.
- Web Map Services are used in various portals (*e.g.* BGS Offshore map products).

Over the last year, in the OGC API there has been an addition of Gravity and Magnetic data layers, which improves access to data which were previously available under licence. The AGS API improvements also improves access. The MEDIN metadata subportal is live and now has a CSW and OGCAPI-Records endpoint for the MEDIN collection. During 2024/25 there will be a Metadata editor project, which will include improvements to the metadata export to GN workflow - this should include upgrading or records to latest Gemini and MEDIN versions, depending on the budget.

Marine Meteorology DAC (Met Office) Data sets are requested through email/telephone enquiry. The request may be passed to their Data Provisioning team, who then provide a quote for the extraction of the data and information requested. Additionally, there are data available on the Met Office public website for moored platform data for the previous 24 hours. Moored platform data for the previous 24 hours are also available, either in full or in part, on the Cefas WaveNet webpage and the National Data Buoy Centre portal run by the US National Oceanic and Atmospheric Administration (NOAA), as well as other weather websites such as Windy.com. Furthermore, Voluntary Observing Ship data and shipborne automatic marine observations are available through ICOADS. Data is also available through the Centre for Environmental Data Analysis (CEDA).

Data are also shared in real time through the World Meteorological Organisation (WMO) Global Telecommunications System and development is ongoing to make metadata access through OceanOps much more efficient.

4.5 Data standards and data quality

Use of MEDIN guidelines by depositors using the MEDIN DACs is variable across the DACs. DASSH and ADS promote the MEDIN guideline formats with their depositors to standardise the data being submitted. The BODC has created a Data Submission App which requires users to submit data with appropriate metadata, which meets the MEDIN standards. The UKHO has rolled out a Data Upload Portal for bathymetry data requiring users to submit data with the correct metadata required for MEDIN standards.

Some DACs, such as Cefas and MDSG only receive data from staff in their own organisations. The MEDIN metadata standard is followed but the use of the guidelines is not widespread within their organisations.

BGS receive data from a wide range of originators and in many formats and it is not known whether the MEDIN guidelines are used by their depositors. DACs such as RCAMHW, Met Office and HES promote the use of specific standards relevant to their communities.

5 DAC Sustainability and Funding

An important aspect of the DAC network is the assurance of long-term sustainability and continuity of service provision. The MEDIN DAC network achieves this by requiring that the core capability of each DAC is underwritten by an organisation or group of organisations (usually the host organisation) that itself has a business requirement to manage data of a particular theme. This approach forms the backbone of the funding/cost model for the MEDIN DACs (see box below). Current status of the individual DACs is as follows:

Funding for the **Bathymetry (UKHO)** and **Marine Meteorology (Met Office)** DAC activities has been incorporated into operational plans and is considered part of business as usual. Funding for the Bathymetry DAC is built into future plans at UKHO and investment is increased each year to ensure continued and increased availability of bathymetry data.

The Species and Habitats DAC (DASSH) is currently in discussion with Defra and Scottish Government to confirm the future funding model.

Funding for the **Water Column Oceanography (BODC)** and **Marine Geology and Geophysics (BGS)** DACs appears secure in the short term with no reductions (although this is not inflation-proofed). These two data centres had their NERC Data Centre National Capability evaluation and commissioning process approved in 2023 for a further 5-year funding cycle. There have also been funding calls from the UKRI Digital research infrastructure programme. NERC remains committed to data management for the medium and long term. For **Water Column Oceanography (BODC)** there is further funding from EU projects.

FishDAC: Cefas operates under a yearly funding cycle and funding is approved to support data management activities in FY23/24. For **MDSG**, the funding situation is stable, with Marine Directorate funding a full-time data management post with responsibility for the MEDIN DAC function.

Historic Environment DAC: The ADS is hosted by the University of York, Department of Archaeology, as a Cost Centre. The ADS' long-term business plan is under constant review and is monitored by the ADS Management Committee. The ADS 5-year plan currently runs to July 2026. This was reviewed by the Management Committee, on which MEDIN is represented. The plan covers aims and objectives for the coming period as well as an assessment of the external environment in which the ADS operates. This report is compiled in conjunction with a Risk Register. Both documents are made available to the MEDIN representative on the ADS Management Committee. The ADS business model is a mix of direct core funding, project funding and consultancy. The ADS continues to receive core funding via the UKRI, as part of the Infrastructure for Digital Arts and Humanities programme overseen by the AHRC. ADS consultancy relates to the archiving of datasets for long-term preservation on behalf of a depositor, with charging for deposition that covers all parts of the data lifecycle. Since the decision in 2020/2021 by the

Chartered Institute for Archaeologists (CIfA) to impose new requirements for digital archives from commercial fieldwork to be deposited with a CoreTrustSeal accredited repository there has been a continued increase in the number of datasets deposited with the ADS. The ADS operating environment is still extremely optimistic due to this increase in 'consultancy' work, strategic key agreements with several large infrastructure project, and funding from the UKRI. This healthy funding situation has seen the ADS able to invest in key staffing areas, and the team currently stands at 24 full time members of staff (compared with 20 in 2022/2023 report).

The other two components of the Historic Environment DAC (**HES** and **RCAHMW**) are funded through the Scottish and Welsh Governments respectively. However, funding for 2024/25 has been cut by 11% across the historic environment sector. This may have an impact in the next reporting year. Historic Environment Scotland receives additional revenue from its Commercial and Tourism arm. Additionally, the UKRI funded Unpath'd Waters project is supporting data standards tasks until autumn 2024.

Acronyms and Glossary

ADS	Archaeology Data Service
AGU	American Geophysical Union
AHRC	Arts and Humanities Research Council
APDS	Autonomous Platform Data System
API	Application Programming Interface
ARGO	Array for Realtime Geostrophic Oceanography
AUV	Autonomous Underwater Vehicle
BGS	British Geological Survey
BODC	British Oceanographic Data Centre
CC-BY	Creative Commons License (Credit must be given to the creator)
CC-BY-NC	Creative Commons License (Credit must be given to the creator, only non-commercial uses of the work are permitted)
CDI	Common Data Index
CEDA	Centre for Environmental Data Analysis
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CHNT	Cultural Heritage and New Technologies
CIG	COST (Cooperation in Science and Technology) Innovation Grant
CSB	Crowdsourced Bathymetry
CSR	Cruise Summary Report
DAC	Data Archive Centre
DARIAH	Digital Research Infrastructure for the Arts and Humanities
DASSH	The Archive for Marine Species and Habitats Data
DATRAS	Database for Trawl Surveys
DBOSSH	internal DASSH database
DCDB	Data Centre for Digital Bathymetry
Defra	Department for Environment, Food & Rural Affairs
DOI	Digital Object Identifier
EDR	Environmental Data Retrieval
EDS	(NERC) Environmental Data Service
EGO	Everyone's Glider Observatory
EIHA	Environmental Impacts of Human Activities
EMODNet	European Marine Observation and Data Network
ERDDAP	Environmental Research Division's Data Access Program
EU	European Union
EurOBIS	European node of the Ocean Biodiversity Information System (OBIS)
FAIR	Findable, Accessible, Interoperable, Reusable
FAIR-EASE	Horizon Europe project - Building Interoperable Earth Science & Environmental Services
FAIR-IMPACT	Horizon Europe project - expand the use of FAIR-enabling solutions across the European Open Science Cloud
GBIF	Global Biodiversity Information Facility
GDAC	Global Data Assembly Center
GEBCO	General Bathymetric Chart of the Oceans
GEOTRACES	International study of the Marine Biogeochemical cycles of trace elements and their isotopes
GLOSS	Global Sea Level Observing System
GOA-ON	Global Ocean Acidification Observing Network
GOOS	Global Ocean Observing System
HE	Historic Environment
HES	Historic Environment Scotland
HTTP	Hypertext Transfer Protocol
ICES	International Council for the Exploration of the Sea
ICG-Noise	Intersessional Correspondence Group on Underwater Noise
ICG-QSR	Intersessional Correspondence Group on managing the Quality Status Report
ICOADS	International Comprehensive Ocean-Atmosphere Data Set
IDP	Intermediate Data Product

iFDO	image FAIR Digital Object
IHO	International Hydrographic Office
INSPIRE	INfrastructure for SPatial Information in Europe
IOC	Intergovernmental Oceanographic Commission
IODC	International Oceanographic Data Conference
IODE	International Oceanographic Data and Information Exchange
IPT	Integrated Publishing Toolkit
JASMIN	The UK's data analysis facility for environmental science
MBA	Marine Biological Association
MDSG	Marine Directorate, Scottish Government
MEDIN	Marine Environmental Data and Information Network
MERMAN	Marine Environment Monitoring and Assessment National database
MSS	Marine Scotland Science
NBN	National Biodiversity Network
NCEA	Natural Capital and Ecosystem Assessment
NERC	Natural Environment Research Council
NMRW	National Monuments Record of Wales
NOAA	National Oceanic and Atmospheric Administration
NOC	National Oceanography Centre
NODB	National Oceanographic Database
NODC	National Oceanographic Data Centre
NVS	NERC Vocab Server
OASIS	Online system for reporting archaeological investigations and linking research outputs and archives
OBIS	Ocean Biodiversity Information System
OceanOPS	International Center of Excellence for Coordination and Monitoring of Meteo-Oceanographic Observing Systems
ODA	Open Document Architecture (format)
ODIS	Ocean Data and Information System
OGC EDR API	Open Geospatial Consortium Environmental Data Retrieval Application Programming Interface
OGL	Open Government Licence
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
OTGA	Ocean Teacher Global Academy
PDL	Published Data Library
PID	Persistent Identifiers
RCAHMW	Royal Commission on the Ancient and Historical Monuments of Wales
RDA	Research Data Alliance
RI	Research Infrastructure
SAMS	Scottish Association for Marine Science
SeaDataNet	Pan-European Infrastructure for Ocean and Marine Data Management
SEADDA	Saving European Archaeology from the Digital Dark Age
STAC	Spatio-Temporal Asset Catalogue
TNC	Towards a National Collection
UI	User Interface
UNESCO	United Nations Educational, Scientific and Cultural Organization
UK	United Kingdom
UKRI	UK Research and Innovation
UKHO	United Kingdom Hydrographic Office
UNPATH	Unpath'd Waters: Marine and Maritime Collections in the UK
URL	Uniform Resource Locator
WAFS	Web Accessible Folders
WMS	Web Map Service
WMO	World Meteorological Organisation
XML	Extensible Markup Language

MEDIN DAC Cost Model

The DAC cost model proposed and adopted in November 2010 identifies four aspects of the DAC function: Core Capability, MEDIN Coordination, Additional Archiving, and Data retrieval / distribution, as described below:

Core DAC Capability
"Core" DAC capability includes infrastructure costs and some routine data archiving. It is expected that core DAC funding is provided by organisations with a strategic interest in a national DAC capability for specific data types. MEDIN acts to provide an overview and to consider whether funding of this core capability is secure or at risk.
Funded by the organisation hosting the DAC, or in the case of DASSH by a consortium of organisations.

MEDIN co-ordination
MEDIN acts to ensure common standards and service provision across the MEDIN DAC network. The cost of MEDIN coordination activities is shared between MEDIN Sponsorship funds and the DACs themselves.
Funded by MEDIN Sponsor funds and DACs through in-kind effort

Additional Archive Costs
In the general case, the costs of archiving newly collected data should be funded by the data providers, in the form of one-off fees to the DACs in return for the services provided. This data archiving cost is not currently included in the overall budget of many monitoring and research programmes.
Funded by data suppliers

Data retrieval / distribution
MEDIN DACs will provide data access to the original data provider at no cost and will manage third party access to data sets according to terms agreed with the data provider. If no constraints are required by the owner, data will be made available to third parties at no cost, beyond any necessary to cover costs of retrieval / provision.
No cost