Annual Report 2015-2016

Measure once, use many times

1 Highlights in 2015-16

Important progress was achieved by MEDIN in 2015-16.

1.1 MEDIN's aim to provide the single point of contact for UK marine data is increasingly successful. The number of datasets available on the MEDIN portal increased to over 9,900, up from around 9,500 in March 2015. The records cover a broad range of marine disciplines and originate from a variety of public and private organisations.

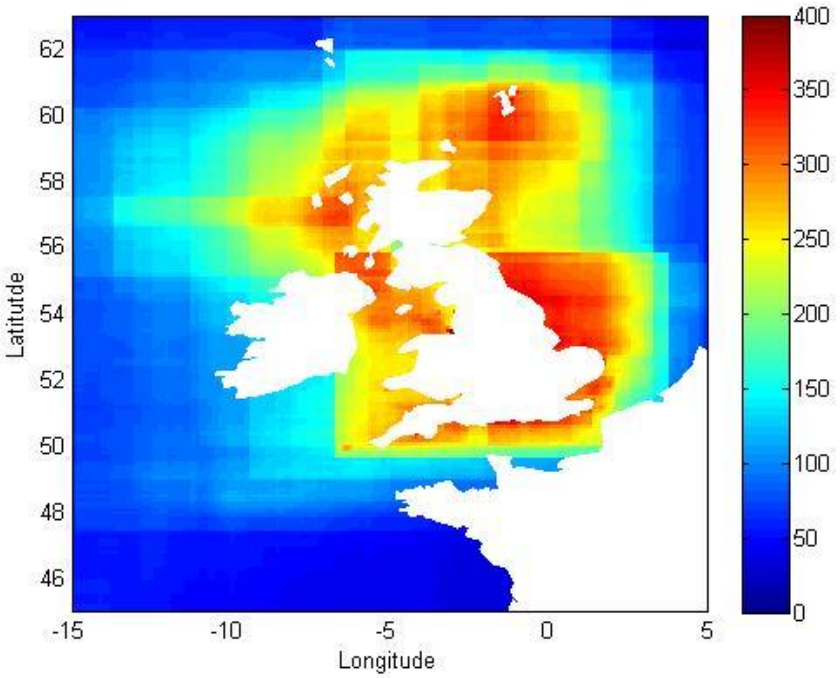


Figure 1: Heatmap showing the density of marine datasets made available on the MEDIN Portal (number of datasets covering each location).

1.2 MEDIN consulted users from its 5 main user groups (Government departments/agencies; commercial organisations; academia/research councils; charities/Non-Governmental Organisations; and the general public) as to how the MEDIN portal should be redeveloped. The portal re-development will commence in 2016-17.

1.3 Data Archive Centres (DACs) continue to archive data from MEDIN partner and third party organisations to agreed individual programmes. The 2015-16 DAC annual report shows that:

- The number of datasets held by the DACs is 9342, about 10% more than 2014-15, and 2.5 times more than 2011-12
- 1,494 new datasets were archived in the DACs (slightly less than in 2014-15 but twice the number in 2011-12)
- 3,201,380 requests for data were received by the DACs: this is 250% more than 2014-15 (mainly due to a four-fold increase in records downloaded from DASSH and a six-fold increase for BGS) and 15 times more than 2011-12.

- All the DACs are receiving data from at least 1 Marine Science Co-ordination Committee (MSCC) member – the following DACs have multiple MSCC members supplying data: BODC (14), BGS (11), UKHO (9) and DASSH (8)

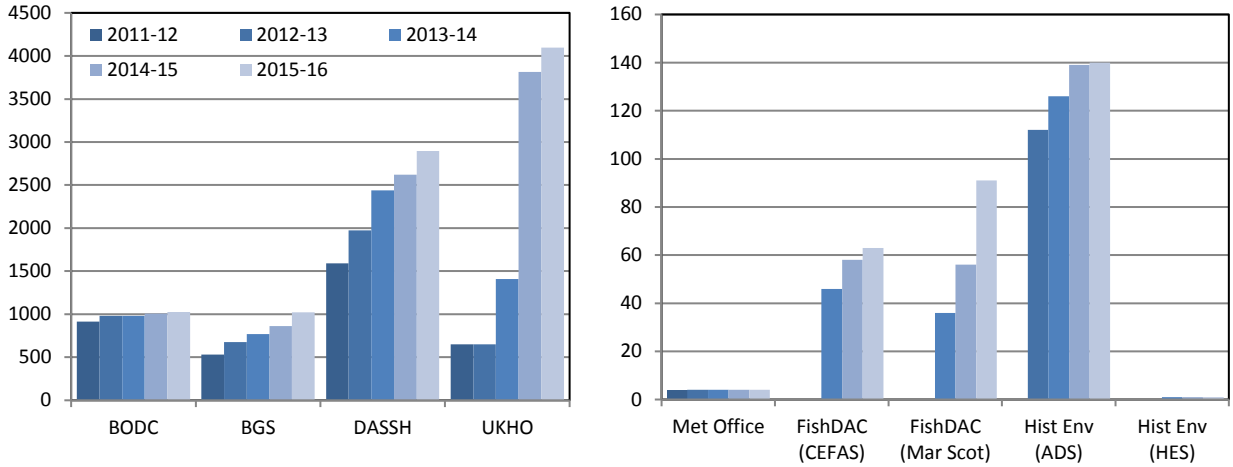


Figure 2: Number of datasets held at each MEDIN Data Archive Centre since FY 2011-12.

1.4 The network of MEDIN Data Archive Centres (DACs) expanded further this year, with one additional organisation submitting accreditation documents to become a DAC. The Royal Commission on the Ancient and Historical Monuments of Wales (RCHAMW) will become the third member of the historic environment DAC when the accreditation has been accepted.

1.5 MEDIN has been working alongside marine industry to gain a better understanding of industry needs and motivation for sharing data. A report reviewing access to industry data published this year concluded *"MEDIN infrastructure provides a sound platform through which to make industry data available".* The MEDIN Open meeting, which attracted over 60 participants, developed the themes of the report. In the next year, MEDIN will facilitate increased archiving of industry data at MEDIN DACs and provide targeted data management training for industry partners.

1.6 MEDIN have helped the Defra family of organisations in their aim to 'open up access to 8,000 datasets in a year initiative'. By promoting the Open Government License and publishing metadata to data.gov.uk, MEDIN has been generally helping Defra in opening up access to marine data for several years.

1.7 This year MEDIN supported 6 small data archiving projects at the DACs, ensuring valuable datasets are not lost.

1.8 MEDIN-run training workshops were well attended and well received by private and public sector representatives of the marine community.

1.9 MEDIN has supported its partners in reporting monitoring programmes for the Marine Strategy Framework Directive (MSFD) via its management of the UK Directory of Marine Observing Systems (UKDMOS). There are over 275 UK monitoring programmes described in UKDMOS, relating to 15,000 sites.

1.10 MEDIN welcomed the Centre for the Environment, Fisheries and Aquaculture Science (Cefas) as its 16th sponsor.

2 Performance Summary

2.1 2015-16 was the second year under the five year (2014-19) MEDIN Business Plan. MEDIN has moved to a fully operational phase from the transition phase with a reduced level of funding, from £763K per year before 2011 to £490K in the last year.

2.2 Priorities identified in the 2014-19 MEDIN Business Plan that were targeted in 2015-16 are identified by the High Level Objectives in table 1. Table 1 also details the Key Performance Indicators (KPIs) used to assess whether the objectives were met.

2.3 MEDIN fully or partially achieved 23 of the Key Performance Indicators for 2015-16.

Not achieved	Partially achieved	Fully achieved
0	11	12

High Level Objective	Key Performance Indicators	Success	Details
1. The MEDIN framework is adopted across the UK	…DAC network, standards and metadata portal adopted across the UK within organisations' operational data strategy. This was measured by the following statistics:		
	a) DAC statistics – Show increase in no. of datasets or no. of observations year on year (from 2012 baseline)	Fully achieved	It is difficult to compare absolute numbers of datasets between DACs, as the size of datasets can vary significantly between and even within DACs. However, the number of datasets received by the DACs during 2015-16 was twice the number received during 2011-12. This excludes the Met Office, which augmented its 4 marine datasets with an additional 6 million new observations during 2015-16.
	b) Standards use – Show increase in downloads per month of data guidelines (from Mar 2013)	Fully achieved	8454 separate downloads of data guidelines registered by web statistics in 2015/16 3102 downloads of Discovery Metadata standard, Maestro downloads 597 since downloads started, 295 distinct users. 102 downloads in 2015/16 by 68 users, 39 of which are new users. Online tools – 506 registrations since 2010, 73 new users in 2015/16 and 170 new records created in 2015/16
	c) Portal Use – achieve at least 50 views per month	Fully achieved	There were over 45,000 visits to the MEDIN portal in March 2016 compared to ~14,000 in March 2015

2. Coordinated DAC approach for archiving / retrieving data	….. with support for users		
	a) Centralised archiving guidelines – published on MEDIN website by end Q3	Partially achieved	Draft centralised archiving guidelines produced but not yet finalised across all DACs
	b) 2 worked examples of multidisciplinary datasets being archived by end Q3	Partially achieved	Only 1 worked example completed - Marine Conservation Zone (MCZ) data archived across three MEDIN DACs – BGS, DASSH and UKHO.
3. Support the partners in meeting INSPIRE obligations	…to publish metadata and provide compliant data view and download services		
	a) Report on meeting INSPIRE obligations by each DAC to MEDIN executive team by end Q1	Fully achieved	Most DACs provide view and download services, but not all are INSPIRE compliant. See 3c.
	b) All MEDIN metadata records designated to be published on data.gov.uk in 2015-16 successfully published there by end of Q4.	Fully achieved	
	c) Number of INSPIRE compliant view and download services offered by DACs increased from March 2015	Partially achieved	Compliance amongst the DACs is increasing with 5 DACs (UKHO, Met. Office, DASSH, ADS, FishDAC (Marine Scotland)) providing INSPIRE compliant view and download services for some or all of their datasets, HES and BGS have some INSPIRE View services and INSPIRE View and Download are planned or under development at 3 more DACs (BODC, BGS, FishDAC (Cefas))
4. MEDIN portal provides comprehensive coverage	… enabling wide-ranging & dynamic access to UK Marine data, Reference data, view and download services and other data products in line with user requirements.		
	a) Stats on coverage of portal (at least 200 new datasets, new reference layers by end Q4)	Fully achieved	9959 datasets described in MEDIN portal in March 2016 (up from 9548 in March 2015). 40 new reference data layers have been added taking the total to 115
	b) Pilot linked online resources using MEDIN Gazeteer	Partially achieved	Work on updating the MEDIN Gazetteer is underway but work on linked resources has not yet started.

5. Manage data for use in MSFD	…Store, manage and make available UK monitoring data for use in MSFD assessment, according to the agreed approach		
	a) Facilitate data flow to MEDIN DACs for MSFD monitoring by taking a lead in the MARG/MEDIN Data Group	Partially achieved.	MEDIN is actively involved in the Data Task Group. List of monitoring data sent to MEDIN DAC working group for consideration.
	b) UKDMOS guidance for providing updates in place by Q2	Fully achieved	New guidance documentation created for updating UKDMOS by end Q4. Feedback from initial users has been positive. UKDMOS is now being updated more efficiently.
6. Provide access to data services and data products	… defined key data services and priority common data products		
	a) Stats on products and services hosted by MEDIN, and on usage (page views / downloads) to determine baseline for future comparisons.	Partially achieved	729 GIS datasets available on MEDIN portal, predominantly available via direct link to source.
7. Promote the re-use of data	…. resulting in a sustained increase in the number of successfully furnished requests for archived data from the public, government and industry.		
	a) No / nature of data searches and downloads maintained at 2014/15 levels.	Fully achieved	All DACs who record metrics show an increase since 2011-12. Data searches and downloads are not recorded at all DACs. However, for those that do: BODC and Historic Environment DAC (ADS and HES) show a moderate increase in the number of requests/data downloads compared with 2014-15 whereas BGS and DASSH show very significant increases; the former due in part to new Web Map Services.
	b) Analysis of these reported to MEDIN Executive Committee in Q1.	Partially achieved	As noted above, not all DACs record data searches and downloads. However, DASSH statistics show that a considerable proportion of the data requested in 2015-16 was used for statutory work.
8. Adoption of data guidelines across the marine sector,	… including MSCC members as a standard condition of funding for data collection.		

	a) Increase no of MSCC orgs applying MEDIN guidelines and no of MSCC orgs requesting MEDIN guidelines from contractors.	Partially achieved	5 MSCC members confirmed they apply MEDIN guidelines and Discovery standard themselves, and request this from contractors where possible, the same number as in 2014/15. The organisations are Marine Scotland, Cefas, Natural Resources Wales, UK Hydrographic Office and JNCC.
	b) At least 50 attendees at MEDIN workshops (10% increase from 2014-15)	Partially achieved	49 attendees in total this year at 5 MEDIN workshops.
	c) Workshop feedback to maintain positive level reported in 2014/15	Fully achieved	Over 30% of attendees provided feedback. All positive – rating of satisfactory or better.
9. Demonstrate the value of using the MEDIN framework	Provide tangible case studies demonstrating the value of using the MEDIN framework when locating, accessing and retrieving data for projects.		
	a) Case study by end Q4	Fully achieved	3 recently published reports clearly show that data held in all MEDIN DACs are important to different stages of many marine industries. Findings presented to MEDIN Sponsors in Q4.
10. Raise the profile of MEDIN	… in the academic and private sectors, attracting further members to the network and widening the sources of data.		
	a) 4 issues of Marine Data News	Fully achieved	The quarterly online newsletter included articles on Scotland's marine portal, a report on access to industry data, the Marine Data Exchange and NERC's Envirohack event amongst many others.
	b) Partners Meeting with increased attendance compared to 2013/14	Fully achieved	62 attendees at the MEDIN Open meeting "The Industry Marine Data Revolution". Although slightly lower than the previous partners meeting (64 attendees), at least 5 delegates had their day disrupted by travel issues and could not attend at the last minute.
	c) At least 2 Publications	Partially achieved	"A Review of Access to Industry Marine Environmental Data" published http://www.gov.scot/Topics/marine/science/MSCC/PSEG/data
	d) At least 3 visits to academic and 3 to commercial organisations.	Partially achieved	MEDIN met with many commercial organisations at the conferences and meetings attended during the year including CadCorp conference on marine GIS (June 2015), Coastal Futures (January 2016) and the Marine Measurement Forum (March 2016). However MEDIN only managed 1 academic visit - Liverpool Marine Symposium (January 2016).

Table 1: Summary of 2015-16 Key Performance Indicators and progress

3 Performance Details

This section contains details on progress towards each Objective. The MEDIN Work Programme is carried out within 7 work streams. Each work stream defined between three and four Key Tasks in order to meet the Objectives. Progress towards these Key Tasks and their associated deliverables are described in Appendix C.

Objective 1 – MEDIN Framework adopted across UK

The MEDIN Framework consists of: the DAC network; the MEDIN metadata standard and suite of data guidelines; and the MEDIN discovery portal.

The MEDIN network of DACs provides secure long-term storage for marine data together with the capability to upload and retrieve data. All DACs have provided annual reports for 2015-16 detailing new datasets archived and number of datasets held. Note that it is difficult to compare between DACs, as the size of datasets can vary significantly between DACs (and even within DACs). For example, all the data held in the Met Office DAC are maintained in 4 datasets, which were augmented in 2014-15 with 6 million new observations. Highlights for the new datasets archived are given in table 2 and summarised in figure 3.

<table>
<tr><th>BODC</th><th>Met Office</th></tr>
<tr><td rowspan="2">During 2015/2016, BODC received 283 accessions of data from 60 organisations in 13 countries as follows:
134 accessions from NERC laboratories (incl. collaborative centres & NOC)
56 accessions from UK universities
6 accessions from UK Government funded laboratories
15 from commercial organisations
27 from charitable organisations
45 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.

All datasets are prepared using MEDIN guidelines and are banked in either the BODC Series or BODC Samples database after re-formatting, usage metadata compilation, quality control (automatic tests and visual inspection), documentation and audit.

Additionally, 28 datasets were added to the Published Data Library and received a Digital Object Identifier (DOI).</td><td>• The Met Office is currently awaiting the provision of a ‘Service licence’ for the ship-borne automatic weather station (AMOS) network. Once this process has been finalised, a new metadata record for this network will be created.
• Summary of datasets archived (in the last year) – All 4 existing Met Office datasets have been added to over the past year, adding in excess of 6 million observations.
• Pro forma submitted to the Crown Estate regarding the archival of 5 wave datasets from the Atlantic and Argyll arrays, although this is currently on hold pending a decision from the Crown Estate</td></tr>
<tr><td>DASSH
• Non-Native Species MSFD datasets
• Lundy Intertidal Species Assessment
• Cefas MCZ Data
• 1990 - 2015 The Environment Agency (EA) Tamar and Lynher Estuaries Shad surveys
• 2015 The Marine Biological Association of the UK (MBA) Salcombe Bioblitz Survey</td></tr>
<tr><th>ADS (Historic Environment DAC)</th><th>CEFAS (FishDAC)</th></tr>
<tr><td>Rapid Coastal Zone Assessment Dorset: http://dx.doi.org/10.5284/1032954

A phase 1 assessment study covering the area from the Dorset/Hampshire county border to the Dorset/Devon county border, and including an assessment of surviving remains along the open coast and its tidal estuaries, including the</td><td>• Sea Angling 2012
• Historic fishing effort 1913-1980
• Benthic faunal biomass with environmental data, Celtic Seas
• North-East Irish Sea Razor Clam Survey - Fisheries Science Partnership
• Phenological changes in growth in cod as an indicator of climate change</td></tr>
</table>

intertidal zone out to Lowest Astronomical Tide with a 1km 'hinterland' to the landward side of Mean High Water and extending up estuaries to 1km beyond the tidal extent. The current project has created more than 980 new sites and updated another 143 records for sites already recorded. Threats to the coastal historic environment are identified, research priorities and themes are presented in the context of the regional themes and research aims set out in the South West Archaeological Research Framework (SWARF) and specific sites and areas which would benefit from further research or work are also identified.

- Triennial Mackerel Egg Surveys at the Shelf Edge

Marine Scotland Science (FishDAC)

- North Sea IBTS Q1 + Q3
- West Coast IBTS Q1 + Q4
- Herring Acoustic Survey
- Mackerel Acoustic survey
- Monkfish survey + 2 charters
- Nephrops and Scallop Surveys

UKHO

- A total of 211 new datasets were archived.
- 53 x Civil Hydrography Programme, 5 x Royal Navy, 31 x datasets received under the Government Data Sharing MoU, 122 x 3rd Party

BGS

- Work continued towards obtaining a full set of UKHO-held Marine and Coastguard Agency (MCA) bathymetry data from CHP (Civil Hyrography Programme) HI surveys (Hydrographic Instruction) including multibeam products (for BGS use) and raw data along with other associated data and reports of survey. We also hold processed backscatter where available (for DAC and BGS use). BGS also created processed backscatter for some surveys from raw data and will also make raw data available for other organisations who wish to do this.
- Data for MCA CHP Surveys have been received from the UKHO Bathy DAC. Of those received:
  - 156 MCA CHP surveys with something received.
  - 98 surveys with raw data complete (92.3 TB).
  - 87 surveys archived to tape (89.9 TB).
  - 31 surveys still to receive some raw data.
  - Remainder to receive products only as the UKHO Bathy DAC are now going to maintain a RAW data archive.
- BGS have carried out 7 surveys during the year (both BGS surveys and where BGS was the contractor).
- Work continues on sorting data from BGS legacy surveys.

HES (Historic Environment DAC)

434 items, relating to 150 maritime records were catalogued. Several of the items archived are database tables or project reports linked to more than one site record in Canmore.

PREFIX	Count Of PREFIX	Description
551	7	Fonds level record
B	1	Newscutting (catalogued)
DP	110	Digital Image
DT	63	Database
J	1	Newscutting (catalogued)
MS	15	Manuscripts
MV	193	Digital tape
WP	44	Word processed Documents / Pdfs

The seven collections catalogued were:

Collection URL	No of items	Description
1496923	14	Wreck of B98, Bay of Lopness, Sanday
1520397	4	Images of the Teeswood steamship, Skerry Sound, Scapa Flow, Orkney
1520438	26	Video footage from Scapa Flow 2013 Marine Archaeological Survey

• The legacy BGS paper geophysical records that were held at BGS Edinburgh have been transferred to BGS Keyworth for storage and are now available online as Open Data. • MCZ (Marine Conservation Zone) data were received from Cefas (50 surveys). Work on this will continue next FY. Data were received on hard drive and passed to Species DAC at DASSH who then passed this back to Cefas.	1520404	31	Images of the Thames steamship, Skerry Sound, Scapa Flow, Orkney
	1518665	8	Concrete Collier (ship), North Harbour, Creteree: Scalpay
	1517986	1	Photograph in Accession no 2005/208
	1520384	8	Images of Spitfire, Aircraft, Barrel of Butter, Scapa Flow, Orkney

Table 2: Summary of new datasets archived at the MEDIN Data Archive Centres in 2015-16

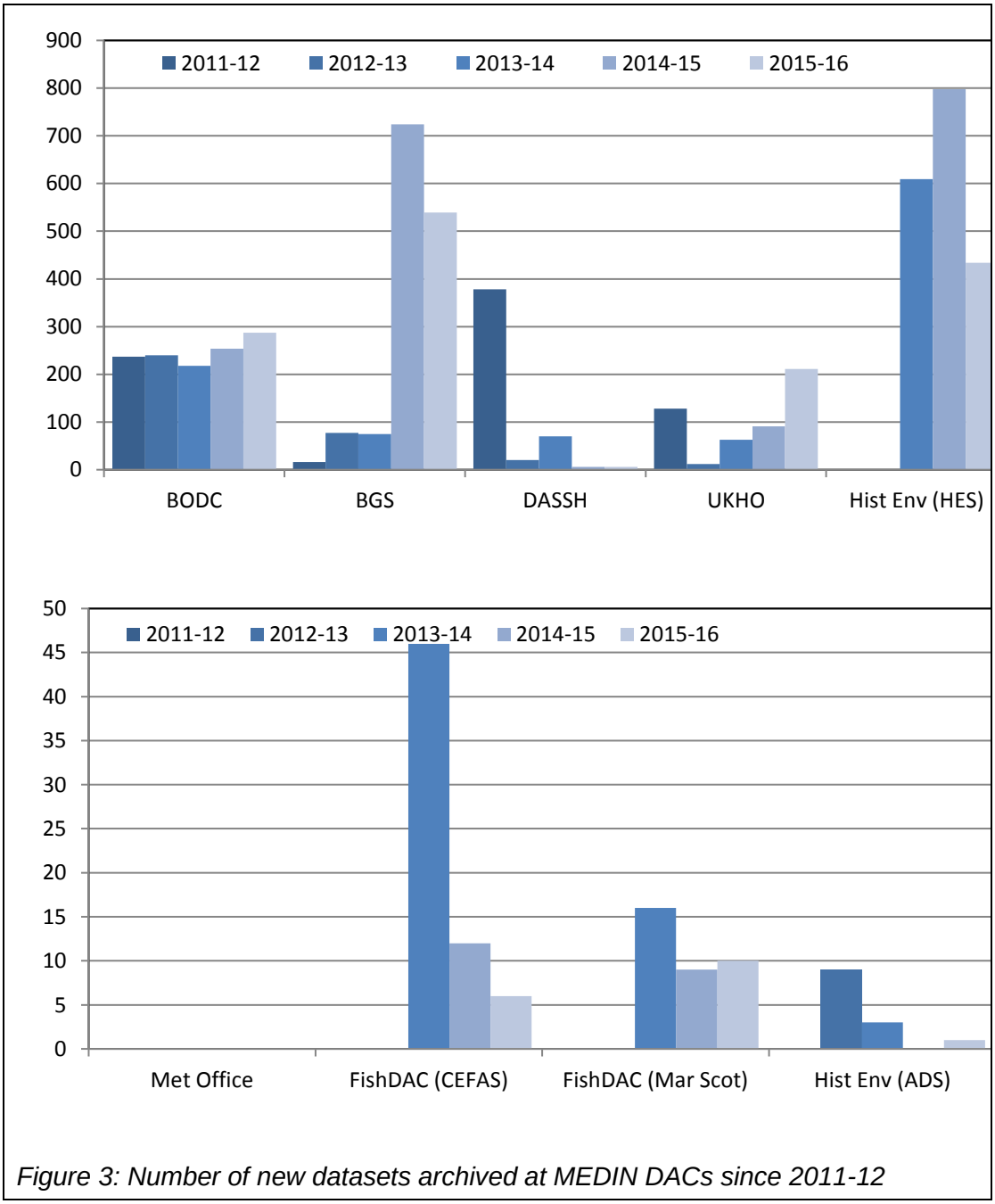


Figure 3: Number of new datasets archived at MEDIN DACs since 2011-12

The marine community continued to expand its use of the MEDIN discovery metadata standard and the MEDIN data guidelines as demonstrated by the frequency of downloads of the MEDIN tools and data guidelines.

Web statistics indicate the use of the MEDIN portal increased threefold over the year, suggesting an increased awareness of the MEDIN framework as a mechanism to find and access marine data.

Objective 2 - Coordinated DAC approach for archiving / retrieving data

The network of MEDIN Data Archive Centres is continuing to grow, with The Royal Commission on the Ancient and Historical Monuments of Wales submitting its accreditation application to become a component of the Historic Environment DAC. The network of MEDIN DACs is taking steps to establish a more coordinated approach to archiving complex datasets, with data starting to flow from one DAC to another where required. For example, datasets collected during Marine Conservation Zone surveys are being passed between DASSH, BGS and UKHO so data from these complex surveys are archived at the most appropriate DAC. Based upon this use case, the DAC Working Group has discussed, proposed and documented a more generic approach (e.g. a central enquiry point, and generic online and downloadable guidance for the DAC network components and data submission). DASSH are reviewing the impact and extra load of expanding their role to be a Data Submission Helpdesk. The intention is to implement this in 2016-17.

Objective 3 - Support the partners in meeting INSPIRE obligations

Table 3 shows the current status of INSPIRE View and Download compliance at the DACs.

DAC Name	INSPIRE View & Download
British Oceanographic Data Centre	INSPIRE compliant view services for two datasets. Download capability exists, but it is not INSPIRE compliant. Further development of INSPIRE compliant services is underway.
British Geological Survey	INSPIRE view (e.g. Offshore Geoindex, Offshore Map products) services; download is available but not INSPIRE compliant.
DASSH	View and download services exist at DASSH and are INSPIRE compliant.
Met Office	1 data set for last 24 hours data.
United Kingdom Hydrographic Office	Yes, both view and download.
FishDAC (Cefas)	View and download under development.
FishDAC (Marine Scotland)	5 datasets with INSPIRE compliant View through the National Marine Plan Interactive and 7 have download *via* Marine Data Portal.
Historical Environment DAC (ADS)	126 collections available as INSPIRE view services, and 60 collections available as download services.
Historical Environment DAC (HES)	INSPIRE compliant view service but not download.

Table 3: Status of INSPIRE View and Download compliance at MEDIN DACs

MEDIN has set up a process whereby it can pass metadata to data.gov.uk and hence to INSPIRE on behalf of its partners on request. All requested metadata records were successfully passed to data.gov.uk by the end of the financial year, helping MEDIN partners meet their obligations under INSPIRE.

MEDIN sits on the AGI GEMINI Working Group, which ensures that any changes to

the INSPIRE discovery metadata requirements get cascaded into the MEDIN Discovery Metadata Standard and also allows MEDIN to inform DACs and partners of upcoming changes and their implications.

Objective 4 - MEDIN portal provides comprehensive coverage

This objective was fully achieved with the number of datasets described in the MEDIN portal reaching 9959, an increase of over 400 over the year. This includes an additional 40 reference layers.

Objective 5 - Manage data for use in MSFD

MEDIN is actively involved in the MEDIN/MARG Data Task Group. A list of monitoring data has been sent to the MEDIN DAC Working Group for consideration and establishing which are relevant to each DAC. The MEDIN/MARG Data Task Group is identifying MSFD datasets to be managed in the DAC network. This will continue into 2016-17.

MEDIN manages the UK Directory of Marine Observing Systems (UKDMOS), which contains information about the monitoring carried out for the Marine Strategy Framework Directive. This year, new guidance documentation was created for updating the content of UKDMOS, which new users found intuitive to use. This has resulted in a more efficient update process.

Objective 6 - Provide access to data services and data products

This year MEDIN hoped to provide a baseline description for the number of web services and data products described in the MEDIN portal. Technical delays meant that the MEDIN portal is not yet able to display metadata for services, so it has not been possible to provide the required baseline. In lieu of this, MEDIN has provided statistics on the number of datasets with a Geographic Information System (GIS) format.

Objective 7 - Promote the re-use of data

The benefits of re-using data are widely recognised by the marine community. This is demonstrated by the levels of data downloaded by the MEDIN DACs. Not all DACs are able to record requests received for data, but those who do all show an increase in the number of requests since 2011-12 (figure 4). Both FishDAC components direct users to the ICES DATRAS database and thus do not have any statistics. However, BODC and the Historic Environment DAC (ADS and HES) show a moderate increase in the number of requests/data downloads compared with 2014-15 whereas BGS and DASSH show very significant increases; the former due in part to new Web Map Services. DASSH have provided a breakdown of distribution of data users and nearly 60% of these requested data for statutory work.

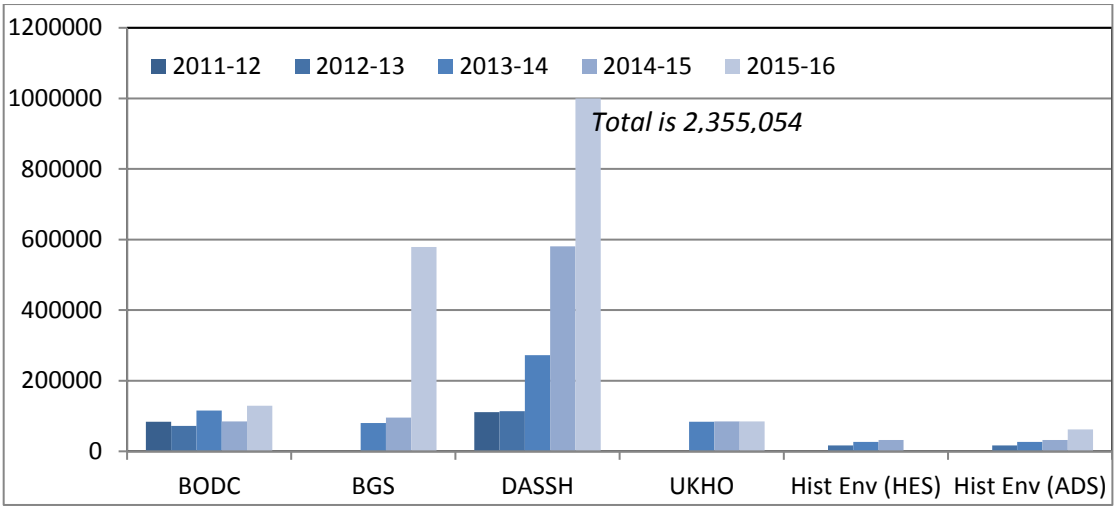


Figure 4: Number of requests for data received by each MEDIN Data Archive Centre since 2011-12.

Objective 8 - Adoption of data guidelines across the marine sector

The MEDIN data guidelines are easy to use guidance on the information that should be collected alongside data to ensure that a dataset is usable by others in the future. The ongoing programme to review and enhance the data guidelines continued this year, with 2 non-biological guidelines updated to the new format, along with a properly structured and defined template being created. DASSH have converted all the biological guidelines to the new format and these will be uploaded throughout 2016. A new guideline for geotechnical data has been drafted and will be published in early 2016 – 17. Uptake of the data guidelines by the marine community is positive, with statistics indicating that the guidelines have been downloaded 8454 times this financial year.

Member organisations of the Marine Science Coordination Committee are asked to report on whether they apply MEDIN Data Guidelines to data they collect or to data that they commission contractors to collect. This provides MEDIN with an additional assessment of the update of data guidelines across this part of the marine community. Responses this year indicate that there are 5 MSCC organisations (the same as last year) applying MEDIN data guidelines to data they collect and that require contractors to use the guidelines.

Objective 9 - Demonstrate the value of using the MEDIN framework

Recent reviews of industry data describe the data that are used by a range of marine industries. The benefits of making it easier to use data are clearly demonstrated by the frequency that data are being re-used. For example, nearly all stages of a windfarm development (initial stages through to decommissioning) require re-use of data of the types held at all of the MEDIN DACs. Some stages of the development require archived data exclusively and other stages use archived data to supplement new data collection.

Objective 10 - Raise the profile of MEDIN

MEDIN's profile was raised via its quarterly online newsletter. Articles are provided by MEDIN partners and the newsletters is distributed electronically to over 580 recipients.

2015-16 saw the return of the MEDIN partners meeting, this year badged as an 'Open Meeting' to encourage attendance from a wider audience. The meeting focused on access to industry data and attracted over 60 attendees from a mixture of

public and private organisations. A report of the meeting is available on the MEDIN website.

MEDIN's profile was further raised by the numerous conferences, workshops and meetings attended throughout the year.

4 Financial Summary 2015-16

4.1 £490,500 was available to fund MEDIN activities in 2015-16 from Sponsorship funds as detailed in table 4. In addition, £94,000 was carried over from previous years and CEFAS committed £30,000 to fund archiving of Marine Conservation Zone (MCZ) data collected during the period April 2014-March 2015 (table 5).

Sponsor Name	**Funding**
DEFRA: Department of Environment Food and Rural Affairs	£160,500
NERC: Natural Environment Research Council	£131,000
Scottish Government	£93,000
DECC: Department of Energy and Climate Change	£30,000
Met Office	£14,000
Natural Resources Wales	£14,000
Marine Management Organisation	£7,000
Maritime and Coastguard Agency	£7,000
The Crown Estate	£7,000
OceanWise	£5,000
HR Wallingford	£5,000
UK Hydrographic Office	£7,000
Joint Nature Conservation Committee	£5,000
Northern Ireland Environment Agency / Agri-Food Biosciences Institute	£5,000
TOTAL SPONSORSHIP	**£490,500**

Table 4: MEDIN Sponsorship for 2015-16

4.2 The use of funds across work streams, and according to category, is given in table 5. Of the £557,392 total spend, £277,394 covered the costs of employment of the MEDIN Core Team and associated overheads (2.81 Full Time Equivalent staff members in 2015-16); £18,199 on Travel and Subsistence, and £204,942 on external contracts which both contributed to the maintenance and operation of the MEDIN network as well as some of the developments described in this report. The major

items of external expenditure in 2015-16 are given in Appendix B. In addition, £56,857 was spent on significant development projects to enhance the MEDIN network.

4.3 The Work Streams with the highest allocation of costs were the DACs (WS1), the Portal (WS3), and Management and Coordination (WS7) all with costs of more than £95,000. WS4 (International Links) and WS5 (Resources and Applications had costs of less than £25,000.

4.4 In 2015-16 there was an end of year under-spend of **£57,108**. NERC has confirmed these funds can be carried forward for use by MEDIN in 2016-17 and 2017-18, in addition to the £48,361 allocated from 2014-15, as approved by the MEDIN Sponsors' Board.

Total MEDIN income 2015/16	**£**		**Actual spend**	**£**	**Spend by Work stream**	**£**
Total Sponsorship commitments	£490,500		*Employment Costs of Core Team*	£277,394	*WS1: Data Archive Centres*	£143,917
Carry over from previous years allocated to development projects	£94,000		*Travel and Subsistence*	£18,199	*WS2: Standards*	£81,179
Additional funds for archiving MCZ data collected 2014-15	£30,000		*Contracts*	£204,942	*WS3: Portal*	£95,697
			Development Projects	£56,857	*WS4: International Links*	£14,527
					WS5:Resources and Applications	£24,096
					WS6: Communications	£38,738
					WS7:Management and Coordination	£102,381
					Development Projects	£56,857
Total Available	**£614,500**		***Total spend***	**£557,392**		**£557,392**

Table 5: MEDIN Spend in 2015-16, by category and by work stream

5 Look ahead for 2016-17

5.1 MEDIN made significant progress towards the 2014-19 Business Plan this financial year. The overall objective is to consolidate the adoption of MEDIN across the UK as the national framework for marine data management.

5.2 Public sector funding was under increasing pressure during 2015-16, which impacted MEDIN when the funding level was cut part way through the year. This meant that fewer development projects were undertaken than were originally planned. These projects have been postponed to 2016-17. All MEDIN operational work continued as intended.

5.3 Despite the significant progress made this year, MEDIN continues to face challenges. There is a desire to expand the sponsor base, particularly towards industry partners. This would take the pressure off existing sponsors and would increase the interaction of MEDIN with the commercial sector. In 2016-17 there will be a continuing focus on access to industry data.

5.4 The MEDIN portal and website, the key interfaces with our users, need updating to meet user requirements and expectations.

5.5 For some time, MEDIN have recognised the need to improve the links from MEDIN metadata to the data they describe. Often, there is no direct access to a dataset from the information on the MEDIN portal, even if that dataset is available online. The frustrated user may be required to search again, login or register on external websites before they are able to access data. In 2016-17 MEDIN hopes to make significant progress towards being able to access data within “2 clicks” from the MEDIN portal.

APPENDIX A: MEDIN Aims, Benefits, Priority Drivers and Organisational Arrangements

A.1 MEDIN aims, benefits, and priority drivers

1. MEDIN is a collaborative and open partnership, established in April 2008, working to improve the management of marine data and information, and provide better access to the UK's marine data resources. Sponsors include government departments, research councils, environmental and conservation agencies, trading funds and commercial organisations. It operates under the auspices of the Marine Science Coordination Committee (MSCC), and reports to that body.
2. MEDIN **aims** to establish a coordinated framework for managing marine data and information, with the following key objectives:
    - A single point of access to all relevant marine data and information.
    - A robust network of definitive integrated Data Archiving Centres (DACs).
    - The provision through the DAC network of priority datasets to underpin UK and EU legislative and obligatory requirements, for monitoring and marine planning, in line with INSPIRE principles.
    - Facilitation of full data flow to the DAC network for all government sponsored contracts in the marine and coastal zone environment.
    - Coordinate input to the development of international data commitments and drivers that may influence marine data management in the UK.
    - Improve mechanisms to facilitate international data exchange (including contributing to global databases).
    - Develop and maintain new/existing MEDIN resources that support improved access to marine data (data catalogues and inventories, data products, services, guidelines and tools).
3. Marine data and information are acquired, maintained and used for a wide variety of different purposes by numerous public and private sector organisations to support their statutory, regulatory, development, commercial and compliance activities. Common to all these activities is the recognition that good quality comprehensive marine data and information are essential as input to good management and evidence based decision making.
4. MEDIN is working to **benefit** its stakeholders in the following five key areas:
    - Marine Monitoring: Enabling UK organisations to meet their obligations under National and International Environmental Legislation.
    - Marine Management and Planning: Supporting a harmonised and improved marine management regime in UK seas.
    - Supporting Scientific Research: Delivery of the UK Marine Science Strategy.
    - Increasing availability of marine data to the public: Making marine environmental data more widely available in accordance with the aims of the UK government's Open Data Policy and the European INSPIRE directive.
    - Cost Reduction: Addressing inefficiencies and reducing costs for data collection and re-use.

5. Each of these **priority drivers** requires improved access to marine environmental information.

Marine Monitoring

6. The UK Government and devolved administrations have adopted a shared vision for clean, healthy, safe, productive and biologically diverse oceans and seas. Specific legislative drivers that relate to this vision include commitments to international treaties, such as the OSPAR Convention, and requirements of European Union Directives, such as The Birds Directive, The Habitats Directive, The Water Framework Directive, and the Marine Strategy Framework Directive. The EU Marine Strategy Framework Directive, with the stated aim of achieving Good Environmental Status for European Seas by 2021, extends the responsibility for monitoring and managing the marine environment out to national limits. Together these obligations demand an ever increasingly complex set of environmental quality and status assessments supported by formal, evidence-based, uses of marine data and information.
7. All these drivers depend on a robust and relevant monitoring regime, generating a variety of raw, processed and interpreted marine data, and access to authoritative, consistent background or base information to provide historical and spatial context. The UK Marine Monitoring and Assessment Strategy (UKMMAS), established to coordinate marine monitoring in the UK, is predicated on a fully operational robust national framework for marine data and information to provide the necessary data management support.
8. Thus MEDIN is working closely with UKMMAS to help ensure the data needed are more easily accessible. A key driver for the immediate future is getting ready for reporting data and information for the Marine Strategy Framework Directive. MEDIN is helping by providing expert input to the working groups developing plans for data and information provision to the EU.

Marine Management and Planning

9. A major objective of the Marine Acts passed by the Westminster and Holyrood parliaments in 2009 and 2010 respectively is the harmonization and integration of the marine licensing and spatial planning regime and a unified approach to marine conservation zone / marine protected area selection. This involves the review and analysis of a wide range of marine environmental data. Without access to authoritative marine data and information the Marine Management Organisation (MMO), Marine Scotland and the bodies with the equivalent responsibilities in Wales and Northern Ireland, will not be able to carry out their functions.
10. Marine planning will require a wide range of existing data resources to be improved, new datasets created and new methodologies and tools developed. Whilst the delivery bodies are in the process of developing and testing tools, the precise details of what data are required within the system are still evolving. MEDIN has a vital role in helping to define, facilitate access to and improve the reference data that will be required to deliver marine plans. This includes specifying data products, providing guidance on how these are created, supported, maintained and improved and how the quality of these data products are assessed and communicated to users.

Supporting Marine Scientific Research

11. The UK Marine Science Strategy, published by the Marine Science Coordination Committee in 2010, sets out a framework for enabling the delivery of world class marine science for the UK. The strategy highlights the need to foster a culture of

data sharing and good management, including common protocols for data collection and quality assurance for data obtained and specifically identifies the key role MEDIN has to establish this in the UK.

Publishing Marine Data to the Public – INSPIRE, UK Location and Data.gov.uk

12. In recent years there has been an increasing demand for wider access to spatial and environmental data, addressed by a number of national, European and international initiatives. The European INSPIRE (Infrastructure for Spatial Information in Europe) Directive places obligations on bodies holding public spatial information in terms of the way they manage, present and describe these data. Nationally, data.gov.uk and the Coalition Government's Transparency Agenda is driving the release of all public service information, including geographic and marine information, under common licence terms through a consistent and open set of technologies. The data.gov.uk portal enables the central searching of metadata from a variety of sources and resources are being developed to help public sector bodies meet their obligations under INSPIRE, as well as FOI, EIR and ROPSI legislation.

13. MEDIN is working closely with the above initiatives to tailor and develop additional resources specific to the marine domain, as well as informing and providing the necessary guidance for preparing and publishing marine specific data and metadata. The UK geoportal will harvest metadata published to the MEDIN portal and reference geographies established within the UK Location infrastructure extended to include MEDIN specified marine and coastal reference data. Overall, MEDIN will provide the insight and coordination required to ensure the marine community realises the benefits of these wider initiatives, whilst at the same meeting the needs, developing the resources and providing the required leadership to the marine sector.

Cost Reduction and Efficiency Gains

14. Everyone in the marine sector stands to benefit from efficiency gains in data access and re-use. The wide range of potential beneficial impacts include:

    - Improved capture and re-use of industry and research generated data to save industry money and achieve better value from public and private funding.
    - Research to be better informed and coordinated with less replication of effort and collaboration opportunities more easily identified.
    - Wider availability of data to support transparency in decision-making.
    - Reductions in the proportion of project budgets spent on locating, accessing and retrieving marine data.

A.2 MEDIN organisational arrangements

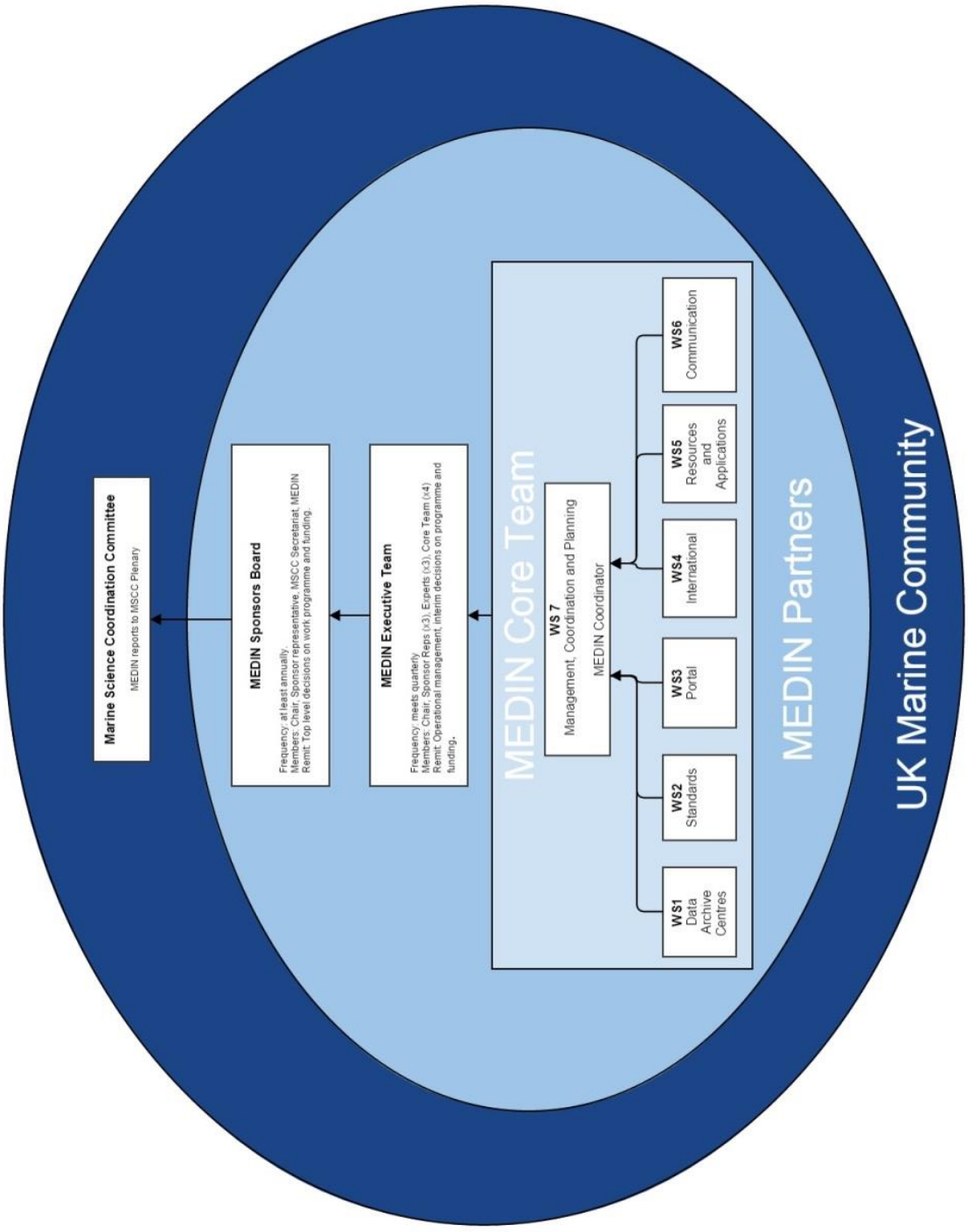


Figure 5: Schematic of the MEDIN organisational arrangements

15. The Marine Science Coordination Committee (MSCC) is the parent body for MEDIN; it provides strategic direction to MEDIN and defines high-level goals. MEDIN reports to MSCC, through this annual report and shorter progress updates as requested. MSCC has requested that MEDIN, along with other smaller groups, provides its progress updates via the Marine Assessment and Reporting Group (MARG).
16. The MEDIN Sponsors' Board is the executive body, responsible for approving

budgets and work programmes. It will meet at least once each year, to be called by MSCC. The current chair of the MEDIN Sponsors' Board and the Executive Team is Professor Peter Liss, CBE FRS.

Members of the MEDIN Sponsors' Board 2015-16:

Dr. Deborah Hembury	*DEFRA: Department of Environment Food and Rural Affairs*
Dr. Graham Allen	*NERC: Natural Environment Research Council*
Martyn Cox	*Scottish Government*
Saravanan Marappan	*DECC: Department for Energy and Climate Change*
Jon Turton	*Met. Office*
Dr. Helen Wilkinson	*Natural Resources Wales*
Dr. Anjan Pakhira	*Marine Management Organisation*
Robert Kinnear	*Maritime and Coastguard Agency*
Dr. Edward Hosken	*UK Hydrographic Office*
Peter Edmonds	*The Crown Estate*
Dr. Quillon Harpham	*HR Wallingford / SeaZone*
John Pepper	*OceanWise*
Dr. Steve Wilkinson	*The Joint Nature Conservation Committee*
Claire Vincent	*DOENI: Department of the Environment , Northern Ireland*
Dr. Matt Service	*AFBI: Agri-Food and Biosciences Institute*

17. The MEDIN Executive Team meets quarterly, with the remit to provide interim guidance and management of the MEDIN work programme between Sponsors Board meetings.

Members of the MEDIN Executive Team 2015-16:

Dr. Deborah Hembury (DEFRA)	*Dr. Clare Postlethwaite (MEDIN)*
Dr. Graham Allen (NERC)	*Dr. Lesley Rickards (MEDIN)*
Martyn Cox (Scottish Government)	*Dr. Robin McCandliss (MEDIN)*
Mark Halliwell (UKHO)	*Dr. Sean Gaffney (MEDIN)*
Jon Parr (DASSH)	*Dr. Gaynor Evans (MEDIN)*
Dr. Ulric Wilson (JNCC)	*Hannah Williams (MEDIN)*
Dr. Mike Osborne (OceanWise)	

18. The MEDIN work programme is carried out within seven work streams (figure 5). Work stream leaders have been appointed and are responsible for the management and planning of the work stream activities.

19. A MEDIN core team of seven part-time staff is hosted by the British Oceanographic Data Centre, which provides administrative and logistic support to MEDIN. The MEDIN core team provides project management, leadership for the seven work streams and secretariat support.

Members of the MEDIN Core Team 2015-16:

Dr. Clare Postlethwaite:	*MEDIN Coordinator; Lead on Work Streams 5 (Resources and Applications) and 7 (Management and Coordination)*
Dr. Lesley Rickards:	*Lead on Work Streams 1 (DACs) and 4 (International Coordination)*
Dr. Robin McCandliss:	*Support to Work Stream 1 (DACs)*
Dr. Sean Gaffney:	*Lead on Work Stream 2 (Standards) and support to Work Str 5 (Resource and Application Development)*
Dr. Gaynor Evans:	*Lead on Work Stream 3 (Portal, Products and Services) and support to Work Stream 5 (Resource and Application Development)*
Hannah Williams:	*Lead on Work Stream 6 (Communication) and support to Wo Stream 3 (Portal, Products and Services)*
Paul McGarrigle:	*Administrative Support*

Organisations active in MEDIN

red and italics indicates sponsor

ABPmer	Marine Environmental Consultancy, (www.abpmer.co.uk)
ADS	Archaeological Data Services **Accredited MEDIN DAC** http://archaeologydataservice.ac.uk/
AFBI	Agri-Food and Biosciences Institute (Northern Ireland), (www.afbini.gov.uk)
Atkins Global	Consultancy http://www.atkinsglobal.com/
BGS	British Geological Survey, **Accredited MEDIN DAC** (www.bgs.ac.uk)
BODC	British Oceanographic Data Centre**, Accredited MEDIN DAC** (www.bodc.ac.uk)
CEFAS	Centre for Environment Fisheries and Aquaculture Science, **Accredited MEDIN DAC.** (www.cefas.co.uk)..
The Crown Estate	http://www.thecrownestate.co.uk/
DASSH	Data Archive for Seabed Species and Habitats, hosted at MBA. **Accredited MEDIN DAC**. (www.dassh.ac.uk)
DECC	Department of Energy and Climate Change, (www.decc.gov.uk)
DEFRA	Department for Environment Food and Rural Affairs. (www.defra.gov.uk)
EA	Environment Agency. (http://www.environment-agency.gov.uk)
EDINA	Unit of Edinburgh University. Provides GI services for academic Community. (www.edina.ac.uk)
English Heritage	www.english-heritage.org.uk
Finding Sanctuary	A project aiming to create a network of Marine Protected Areas of the South West Coast of England. (www.finding-sanctuary.org)
Fugro Geos	Met-Ocean Services http://www.geos.com/
Gardline Group	Marine services http://www1.gardline.com/
Geodata	Consultancy based at University of Southampton, specialising in environmental data management. (www.geodata.soton.ac.uk)

Historic Environment Scotland	**Accredited MEDIN DAC**. https://www.historicenvironment.scot/
Historic Scotland	www.historic-scotland.gov.uk
HR Wallingford	Marine consultancy. (www.hrwallingford.co.uk)
IFCA	Inshore Fisheries and Conservation Authorities See links at http://www.southern-ifca.gov.uk/
IMAREST	Institute for Marine Science and Technology. (www.imarest.org.uk)
JohnPepper Consultancy	Consultantcy http://www.johnpepperconsultancy.com/home
JNCC	Joint Nature Conservation Committee.(www.jncc.gov.uk)
Mainstream Renewable Power	Offshore Renewables http://www.mainstreamrp.com
Marine Atlas	Consultancy http://marineatlas.co.uk/
Marine Conservation Society	UK Charity http://www.mcsuk.org/
MMO	Marine Management Organisation (http://www.marinemanagement.org.uk)
MPC	Marine Planning Consultants http://www.marineplanning.org.uk/
Marine Scotland Science	**Accredited MEDIN DAC.** http://www.scotland.gov.uk/topics/marine
MBA	Marine Biological Association (www.mba.ac.uk)
MCA	Maritime and Coastguard Agency.(www.mcga.gov.uk)
MES	Marine Ecological Surveys http://www.seasurvey.co.uk/
Met Office	**Accredited MEDIN DAC.** www.metoffice.gov.uk
MOD	Ministry of Defence. (www.mod.uk)
Natural England	http://www.naturalengland.org.uk/
NRW	Natural Resources Wales (www.naturalresourceswales.gov.uk) *formerly CCW, Countryside Council for Wales*
NERC	Natural Environment Research Council, (www.nerc.ac.uk)
NIEA	The Northern Ireland Environment Agency,(www.ni-environment.gov.uk)

OceanWise Ltd	Private independent consultancy specialising in marine data acquisition, management and GIS (www.oceanwise.eu)
Ordnance Survey	http://www.ordnancesurvey.co.uk/oswebsite/public-sector/index.html
RCAHMW	Royal Commission on the Ancient and Historic Monuments of Wales www.rcahmw.gov.uk
RES Offshore	Renewable energy development http://www.res-offshore.com/
SAMS	Scottish Association for Marine Science (www.sams.ac.uk)
Senergy	Renewable energy development http://www.senergyworld.com/home
Scottish Government	www.scotland.gov.uk
SNH	Scottish Natural Heritage (www.snh.org.uk)
SETech	Geo-Technical Surveying and Engineering http://www.setech-uk.com/
SEPA	Scottish Environment Protection Agency. (www.sepa.org.uk)
SSMEI	Sustainable Scotland Marine Environment Initiative. (clydeforum.org/SSMEI) and (www.nafc.ac.uk/Marine_Management/General/SSMEI)
Titan Surveys	Marine environmental Surveys http://titansurveys.com/
UHI	University of the Highlands and Islands http://www.uhi.ac.uk/en
UKHO	United Kingdom Hydrographic Office**. Accredited MEDIN DAC.** (www.ukho.gov.uk)
Wessex Archaeology	www.wessexarch.co.uk

Glossary

AGI	Association for Geographical Information
CTD	"Conductivity, Temperature, Depth" – shorthand for a standard water column profile measurement of temperature and salinity against depth
DAC	Data Archive Centre
DIKE	Data, Information and Knowledge Exchange
EMODNET	European Marine Observation and Data Network
GEMINI2	Discovery metadata standard managed by the AGI and adopted by data.gov.uk
GTS	Global Telecommunications System
HBDSEG	Healthy and Biologically Diverse Seas Evidence Group
IACMST	Inter Agency Committee on Marine Science and Technology (www.marine.gov.uk)
ICES	International Council for the Exploration of the Sea
INSPIRE	Infrastructure for Spatial Information in Europe, EC Directive (inspire.jrc.it/)
IOC	Intergovernmental Oceanographic Commission
IPR	Intellectual Property Rights
ISO	International Organisation for Standards
MDN	Marine Data News
MEDIN	Marine Environmental Data and Information Network
MMO	Marine Management Organisation.
MSCC	Marine Science Coordination Committee
NGO	Non Governmental Organisations
OSPAR	International Commission for the Protection of the Marine Environment of the North-East Atlantic (www.ospar.org)
OPSI	Office of Public Sector Information

UKDMOS	UK Directory of Marine Observing Systems – an initiative under the UK Marine Monitoring and Assessment Strategy to provide information on marine monitoring programmes.
UKLP	UK Location Programme
UKMMAS	UK Marine Monitoring and Assessment Strategy. The UK government led programme to coordinate marine monitoring necessary to meet government objectives of a clean, healthy, safe, productive and biologically diverse marine ecosystem (see www.defra.gov.uk/environment/water/marine/uk/science/monitoring.htm)
WISE	Water Information System for Europe, a joint initiative between the European Environment Agency and the European Commission.

APPENDIX B: External Expenditure

WS1 Network of Data Archive Centres

Supplier	Item	Cost
BGS	DAC costs	£11,000
BODC	DAC Costs	£11,000
DASSH	DAC costs	£11,000
UKHO	DAC Costs	£13,200
Met Office	DAC costs	£13,200
Fish DAC - CEFAS	DAC costs	£6,600
Fish DAC - Marine Scotland	DAC costs	£6,600
Historic Environment DAC - ADS	DAC costs	£5,500
Historic Environment DAC - HES	DAC costs	£5,500
Met Office	Small data archiving project	£6,000
UKHO	Small data archiving project	£5,760
BGS	Small data archiving project with DASSH	£3,606
BODC	Small data archiving project	£5,000
CEFAS	Small data archiving project- sea angling	£5,888
CEFAS	Small data archiving project - historic fishing effort	£5,938
Multiples suppliers	Meeting costs	£366
Multiples suppliers	Telephone costs	£125
Total Spend		**£116,283**

WS2 Standards for Data and Metadata

Supplier	Item	Cost
DASSH	Standards Working Group Support April 2015 March 2016	£10,165
Seazone	Metadata Maestro support	£5,850
Algaebase	Licence for MSBIAS	£1,000
Cathie Associates	Geotechnical Data Guideline	£4,800
DASSH	Development to MEDIN metadata editor	£7,944
Multiple suppliers	Workshop costs	£65
Multiple suppliers	Meeting costs	£127
Total Spend		**£29,951**

WS3 Web Portal, Products and Services

Supplier	Item	Cost
Maris	UKDMOS Portal Maintenance	£1,800

Geodata	Portal Hosting and public source code repository for MEDIN portal code	£1,667
STFC	Provision of Metadata Service to MEDIN	£13,937
STFC	Development of Metadata Service to MEDIN	£2,889
DASSH	MEDIN Helpdesk support	£9,533
Total Spend		**£29,826**

WS4 International Awareness, Coordination and Data Delivery to Global Databases

No external expenditure was planned for WS4.

WS5 Resources and Applications Development

Supplier	Item	Cost
OceanWise	Update to MEDIN Gazetteer content (to complete Q1 2016-17)	£1,620
Cefas	Pilot project: Sensor Web Enablement (to complete Q1 2016-17)	£13,800
Total Spend		**£15,420**

WS6 Communications: Outreach, forums, publicity

Supplier	Item	Cost
University of Liverpool in London	MEDIN Open Meeting Costs	£1,158
Multiple suppliers	Conference registration (Coastal Futures, IMAREST Oceans of Knowledge)	£708
graphicsworkshop	Materials (6 page leaflet, 2 page leaflet, business cards)	£888
4imprint	Materials (pens & A6 notepads)	£400
CMS	MEDIN Open Meeting advert	£180
MARIS	Conference sponsorship (IMDIS 2016)	£1,200
Total Spend		**£4,534**

WS7 Management, Planning and Co-ordination

Supplier	Item	Cost
Liss Associates	Chairing MEDIN meetings and representing MEDIN at MSCC throughout 2015-16	£4,900
OceanWise	Representing MEDIN at MILG and PSEG throughout 2015-16	£2,402
DASSH	Representing MEDIN at HBDSEG throughout 2015-16	£960
Multiple suppliers	Meeting costs	£363
BT	Teleconference costs	£303
Total Spend		**£8,928**

APPENDIX C: Work Stream Deliverables

WS1 Network of Data Archive Centres

MEDIN has established an operational network of linked marine data archive centres (DACs) to provide secure long-term storage for marine data. This network provides the capability to upload and retrieve data. Those organisations archiving data at a MEDIN DAC should have free access to their data, and DACs manage third party access to these data according to the data provider's specification.

In 2015-16 the following Key Targets were established for WS1:

- ***KT 1.1*** *Archiving: maintain or improve upon 2012 levels of archiving across the DAC network, establish centralized archiving guidelines (links to HL01, HLO2)*
- ***KT 1.2*** *Data Access: DACs develop first instance of INSPIRE compliant view and download and to agree timetable for further publishing. (links to HL03)*
- ***KT 1.3*** *Accreditation: Accreditation of at least one further DAC to join the network (e.g. FishDAC component (AFBI), English/Welsh components of Heritage DAC). (links to HL04)*
- ***KT1.4*** *Data retrieval: DACs to report on rates and changes in data requests as part of annual reporting (links to HL07)*

The Key Targets were met for WS1 as detailed below:

KT 1.1 MEDIN DACs increased their data holdings

The MEDIN DACs have continued to archive data from MEDIN partner and third party organisations to agreed individual programmes. All DACs have provided annual reports for 2015-16 detailing new datasets archived and number of datasets held. Figure 6 shows the number of datasets held by each DAC since 2011. Note that it is difficult to compare absolute values between DACs, as the size of datasets can vary significantly between DACs (and even within DACs). For instance all the data held in the Met Office MEDIN DAC for marine meteorology data are held within 4 datasets, which were augmented in 2015-16 with 6 million new observations.

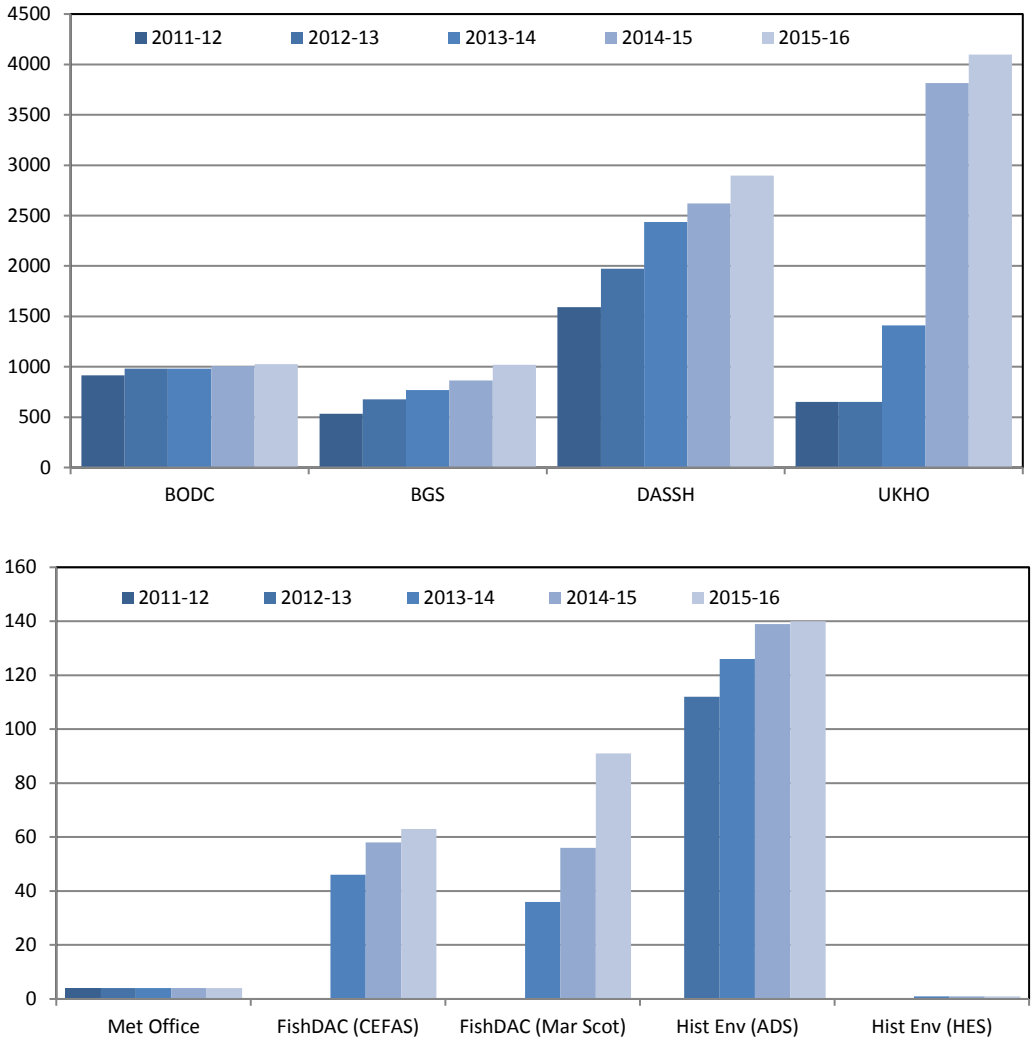


Figure 6: Number of datasets held at each MEDIN Data Archive Centre since FY 2011-12.

Development of centralized archiving guidelines has progressed this year building on discussions at the DAC Working Group meetings and being informed through two case studies: Round 3 Marine Renewables data from The Crown Estate's Marine Data Exchange (MDE) and the MPA/MCZ datasets. DASSH have expanded their role of metadata helpdesk to also encompass data queries.

KT 1.2 More MEDIN DACs have INSPIRE compliant services

Information relating to INSPIRE compliance was requested as part of the DAC Annual Reports. Compliance amongst the DACs is increasing with 4 DACs (UKHO, Met. Office, ADS, FishDAC (Marine Scotland)) providing INSPIRE compliant view and download services for some or all of their datasets, HES and BGS have some INSPIRE View services and INSPIRE View and Download are planned or under development at 4 more DACs (BODC, BGS, DASSH, FishDAC (Cefas)).

KT1.3 RCAHMW applied for MEDIN DAC accreditation

There are currently seven DACs, of these the FishDAC has two accredited components (Cefas and Marine Scotland) and RCAHMW submitted its completed accreditation form as the third component of the Historic Environment DAC; ADS and HES being the other accredited components. The four original DACs (BODC, BGS, DASSH and UKHO) submitted reaccreditation documentation which has now been reviewed. The Marine Meteorological DAC is due for reaccreditation in 2016.

KT1.4 MEDIN DACs recorded increased requests for data

All DACs who record metrics show an increase since 2011-12. BODC and Historic Environment DAC (ADS and HES) show a moderate increase in the number of requests/data downloads compared with 2014-15 whereas BGS and DASSH show very significant increases; the former due in part to new Web Map Services. Data searches and downloads are not recorded at all DACs. For example, BGS note that although they monitor web site visits and use of services, BGS do not have systems in place to generate fully detailed metrics to answer all of the information requested by MEDIN. With successive annual funding cuts limiting their resources, they are prioritising the archiving and delivery of data over the improvement of metric generation. Both FishDAC components direct users to the ICES DATRAS database and thus do not have any statistics. DASSH have provided a breakdown of distribution of data users as shown in figure 7: over the year nearly 60% of the data requested was for statutory work.

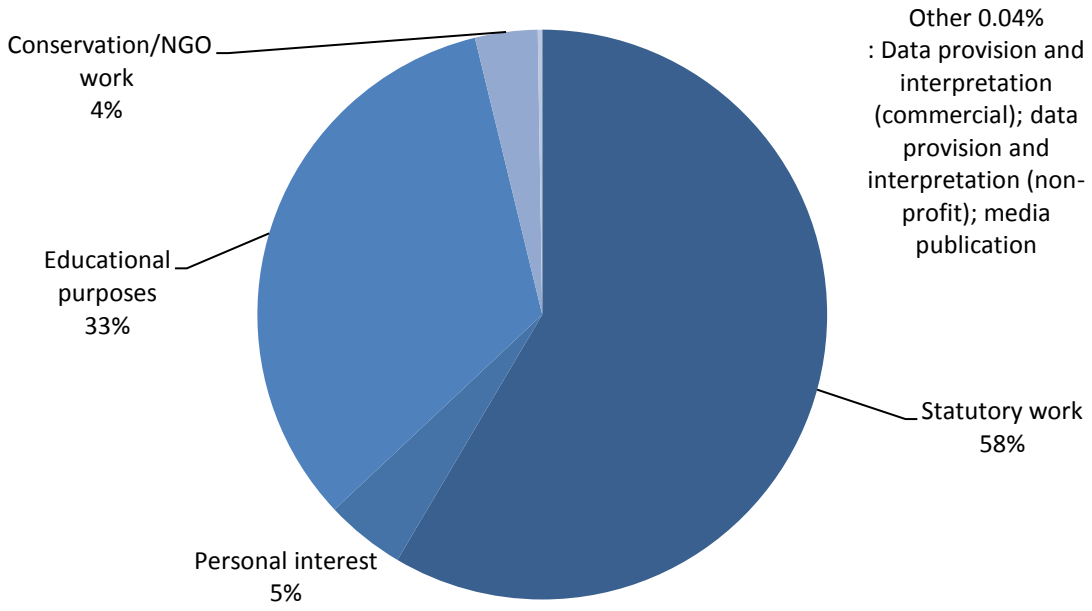


Figure 7: A summary of the users of the 2.3 million records downloaded from DASSH

In general access to data made available by the DACS is free, open and online. Any terms and conditions are provided on the DAC web-sites. Most data from BGS, BODC, Cefas and UKHO are made available under the Open Government Licence (OGL).[KT1.4]

WS1 Deliverables table 2015-16

Q1 Deliverables	Status	Commentary
DAC Annual Reports (2014-15) according to pro-forma (KT1.4)	Achieved	DAC reports received; DAC annual report completed
MCZ / MPA data archiving progress report (KT1.1)	Achieved	Short report received from Marine Geology DAC (BGS).
Establish coordinated archiving approach (e.g. central enquiry point, and generic online and downloadable guidance for DAC network and data submission)	Achieved	Completed in Q3. Approach documented. DASSH to review impact of extra load on Helpdesk.
Plan for reaccreditation in 2015 (KT1.3)	Achieved	Timetable for reaccreditation drawn up. The next DAC requiring this is the Met DAC which was first accredited in December 2011, so re-accreditation will be in 2016.
Q2		
DAC working group meeting	Achieved	Held 14 July
Historic Environment DAC consolidation (KT1.3)	Achieved	Held 29 July; completed accreditation form from RCAHMW received and under review.
Report outlining the approach for archiving TCE Renewables Round 3 data (KT1.1)	Achieved	Report completed. DACs interested in archiving data to submit proposal with costs to TCE. Not all datasets are covered by DACs (e.g. bird data).
Finalise position paper on litter data management	Achieved	Completed in Q3. Feedback from CSSEG incorporated in position paper.
Report on dissemination of data through MEDIN portal (working with Portal WS) and DAC local portals	Achieved	Completed in Q3. Presentation to Sponsor's Board on progress towards aspiration of "2 clicks to data" from MEDIN portal.
Q3		
DAC "Codefest" / DAC technical workshop	Achieved	Completed in Q4. Held on 19 January with technical representatives from Cefas, The Crown Estate, DASSH, BODC, BGS
Complete Fish DAC to incorporate inshore data and establish plan for Northern Ireland (KT1.3)	Not achieved	Special session for FishDAC planned as part of 5th Nov DAC WG meeting but no significant progress made
Identify MSFD datasets to be managed in the DAC network	Not achieved	Postponed from Q1. Waiting for information from MEDIN/MARG data task group. MEDIN core team alerted DACs to monitoring programmes they could archive data from. MEDIN/MARG data task group looking to identify relevant datasets and will report to DACs.
Q4		
DAC Working Group Meeting	Achieved	Held 5th Nov
Report progress with INSPIRE compliant view and download services directly linked to portal metadata (KT1.2)	Achieved	Keiran Millard provided update at DAC WG (5 Nov). Summary of DAC progress provided at DAC meeting.
Report on DAC role in holding / publishing higher level products (with WS5)	Achieved	Statement on MEDIN DAC's role in products provided to Exec Team. A subgroup, including Pete Edmonds, Keiran Millard, Mark Halliwell, Clare Postlethwaite and Mike Osborne produced a list of products which has been circulated.
WS1 Report for 2015-2016	Achieved	

DAC work plan for 2016-17	Achieved

WS2 Standards for Data and Metadata

Standards are essential to support locating and evaluating marine datasets, to provide guidelines for the generation and preparation of data according to recognised standards and best practice, and to help partners meet their obligations under the INSPIRE directive. This aspect of MEDIN activity aims to establish, promote, document and provide guidance for standards for data and metadata to cover an expanding range of data types.

In 2015-16, in agreement with the MEDIN Standards Working Group the following key targets were established:

> ***KT2.1*** *Promote MEDIN data guidelines (links to HL01, HL02, HLO8, HLO10)*
>
> ***KT2.2*** *Hold at least 4 workshops to disseminate MEDIN standards to the wider community (links to HL01, HLO8, HLO10)*
>
> ***KT2.3*** *Ensure coordination with national and international initiatives (links to HLO3)*

The Key Targets were met for WS2 as follows:

KT2.1 MEDIN promoted its data guidelines widely

The MEDIN data guidelines have been promoted throughout the year at MEDIN workshops, national conferences, the MEDIN Open Meeting and via personalised visits to organisations, as well as through social media networks and the online newsletter Marine Data News. MEDIN have continued with the programme to update the guidelines to improve usability with several biological guidelines, the offshore litter guideline and a geophysical guideline all benefiting. MEDIN have received feedback on the style and usability of the guidelines from industry partners which will feed into the Work Plan for WS2 for the coming financial year 2016/17. Moreover, MEDIN commissioned work to develop a new guideline on geotechnical data which will be published in early 2016 – 17, as will the recently reviewed guideline for data from meteorological masts. In total, there were 8,454 downloads of the guidelines this year from the MEDIN website, indicating good uptake by the marine community.

KT2.2 MEDIN ran 5 training workshops

Five workshops have been held throughout 2015-16 to provide instruction and guidance on the use of the MEDIN Data Guidelines and Discovery Metadata Standard. This year the workshop structure was changed to make it easier for attendees to receive more extensive training within a single workshop. Feedback from the workshops was 100% positive, with a selection of comments as follows: "*this was very informative and went into the right amount of detail"; "useful knowledge, well explained"; "good pace and mix of lecture/practical"; informative but in an approachable manner, helpful and friendly"; "very clear and engaging".* MEDIN aims for more extensive advertising of workshops for 2016-17.

KT2.3 MEDIN expanded links with national initiatives

Coordination with national and international initiatives has continued throughout 2015-16, with MEDIN continuing to have close links with data.gov.uk, INSPIRE and the Association for Geographical Information (AGI) who control the UK GEMINI spatial metadata standard.

MEDIN were continually evaluating how INSPIRE requirements were adhered to in the Data Guidelines, in conjunction with the Data Archive Centres. Throughout 2015-16, and continuing to date, MEDIN have been a member of the AGI GEMINI Working Group, which is working to upgrade the GEMINI standard.

In addition, other work completed in 2015-16 includes:

Registrations and downloads of the tools used to create MEDIN discovery metadata were monitored by both BODC and DASSH. In total, 506 people have been registered for the Online Meatdata Editor tool, an increase of 73 from last financial year. 170 records were created using the Online Tool in this financial year. 597 downloads of Metadata Maestro have been recorded to the end of 2015 – 16, an increase of 105 downloads from last year. These downloads have come from 295 distinct users (some users perform repeat downloads). 68 users downloaded Maestro in 2015-16, 39 of them new registrations. The MEDIN tool to convert metadata from ARC10 to MEDIN Discovery metadata XML was downloaded 251 times in 2015 – 16, an increase of 81 downloads from last year. Downloads were carried out by 32 users, 29 of whom were new registrations (241 downloads carried out by new users).

MEDIN uses controlled vocabularies to unambiguously refer to parameters, places and methods relevant to the marine community. These lists were revised as necessary throughout the year – new lists created included vocabularies to describe marine pressures, following documentation from the JNCC and OSPAR. MEDIN supported its partners by supplying marine controlled vocabulary lists to a wider registry controlled by DEFRA. MEDIN also made its partners aware of the new NERC vocabulary server search client, which enables people to search the lists in a much more user-friendly fashion.

Work started in 2015-16 includes:

Upgrades to both the Online Metadata Editor and Metadata Maestro were started in early 2016. The Online Metadata Editor upgrade will result in a smoother interface, which requires less maintenance and can be enhanced more easily, while the Metadata Maestro work involves bug fixing issues identified throughout the year and updates relating to storing metadata for web services. This work is ongoing into 2016-17.

WS2 Deliverables Table 2015-16

Q1 Deliverables	Status	Commentary
Hold Discovery Metadata Standards workshop in Edinburgh	Achieved	This was a composite workshop, with modules on the Discovery Standard and Data Guidelines (as a result of agreement in Standards Working Group)
Convert one data guideline to new format	Not achieved	Postponed to 2016-17 due to other MEDIN work taking priority (new style modular workshop).
Commission guidance on archive standard for collating data	Not achieved	Postponed to 2016-17 due to other MEDIN work taking priority (new style modular workshop).
Hold MEDIN Standards meeting	Achieved	Held in Liverpool on 30 June.
Begin liaison process with providers of UK satellite data to enable	Partially achieved	Liaison has begun. MEDIN are engaged in ongoing discussions to expose BADC and

discovery of remote sensing data on portal		other organisations data on our portal. No metadata however yet supplied.
Commission a data guideline for geotechnical data	Achieved	Completed in Q4 due to delays in procurement process throughout Q2 and Q3
Q2		
Hold Data Guidelines workshop in NOC Liverpool	Achieved	Was held on 24th September – switched from August after discussion at June Standards Working Group meeting
Convert one data guideline to new format	Achieved	Marine Offshore Litter Guideline completed. Other MEDIN tasks took up the time allocated to this in Q2
Publish underwater sound data guideline in new format on website	Partially achieved	Feedback received in Q4 but insufficient time left to finalise and publish completed guideline. Postponed to 2016-17.
Hold MEDIN Standards meeting	Achieved	Held 01 October
Review INSPIRE data specifications	Achieved	Kieran Millard talked to SWG on 01 October about data specifications and their relevance to MEDIN.
Update MEDIN discovery metadata standard and tools following review of metadata for services and other updates	Partially achieved	Standard updated in Q3 but tools not updated this financial year. Standard will not be published until tools are updated to ensure lack of confusion.
Q3		
Hold Discovery Metadata Standards workshop in Crown Estate, London	Achieved	Workshop held 08th December
Convert one data guideline to new format	Achieved	Sediment and rock characteristics guideline re-formatted in early November and sent to BGS for review.
Hold MEDIN Standards meeting	Achieved	Held 19th January 2016
Request feedback from MSCC members on uptake of data guidelines	Achieved	Feedback received from MSCC members
Review data guideline for geotechnical data	Achieved	Completed in Q4 – delayed due to issues with procurement process which delayed start of project.
Publish data guideline for geotechnical data	Not achieved	Publication delayed due to issues with procurement process so publication will not happen until end April, early May 2016
Q4		
Convert one data guideline to new format	Not achieved	More work on liaison with Cathie Associates over geotechnical data guideline was needed than originally estimated which meant time for guideline update was lost.
Hold Data Guidelines workshop in Keyworth	Not achieved	Workshop cancelled due to lack of numbers.
Plan and advertise 4 new workshops for upcoming FY 2016/17	Not achieved	Planning will take place at start of work year for 2016-17 as time at end of 2015-16 needed for other MEDIN tasks.
Hold MEDIN Standards Meeting	Not achieved	Standards Working Group agreed no meeting required this quarter.
Request download statistics for MEDIN tools and data guidelines	Achieved	See Performance Summary and discussion of key targets for WS 2 above
Work Plan 2016-17	Achieved	Draft work plan agreed by Standards Working Group.
Annual Report	Achieved	

WS3 Web Portal, Products and Services

The MEDIN discovery metadata portal provides a single access point from which to find out about marine data from UK organisations across a wide range of marine areas. The Work Programme for 2015-16 fitted under the overall Business Plan for 2014-19.

The following Key Targets were identified for WS3 for 2015-16:

KT 3.1 *Increase portal content of metadata describing services and products. (Links to HL04, HL06)*

KT 3.2 *Improve portal usage as evidenced by increasing web visits by March 2016. (Links to HLO1, HLO4)* (**DR8**)

KT 3.3 *Improve UKDMOS update process as evidenced by increased response rate compared to 2014-15 and availability of update manual for data providers.*

The Key Targets were partially met for WS3 as described below:

KT3.1 Preparatory work started to support the MEDIN portal displaying services

Since it went live in 2010, the MEDIN portal has primarily signposted raw datasets held at a range of organisations. The MEDIN metadata standard can also be used to describe web services that disseminate marine data. However, the MEDIN portal is not yet set up to display such service metadata correctly. Development work to allow the portal harvester to collect service metadata has been performed but further work is required to the portal interface to ensure service metadata can subsequently be displayed correctly. It is consequently not yet possible to reliably identify all metadata describing services and products.

KT3.2 Visits to MEDIN portal increased three-fold

Between April 2015 and March 2016, the total number of visits[1] to the MEDIN portal increased from around 14,000 to over 45,000 per month (figure 8). Towards the end of the year the relocated MEDIN portal, which is now hosted at the British Oceanographic Data Centre, went live. Consequently, more detailed web analytics for the MEDIN portal will be available in coming years.

[1] Number of times a request is sent from a given IP addresses to the MEDIN portal. If less than thirty minutes elapses between 'visits' from a single IP address this counts as one 'visit', if more than thirty minutes elapses between 'visits' from a given IP address, an additional visit is counted.

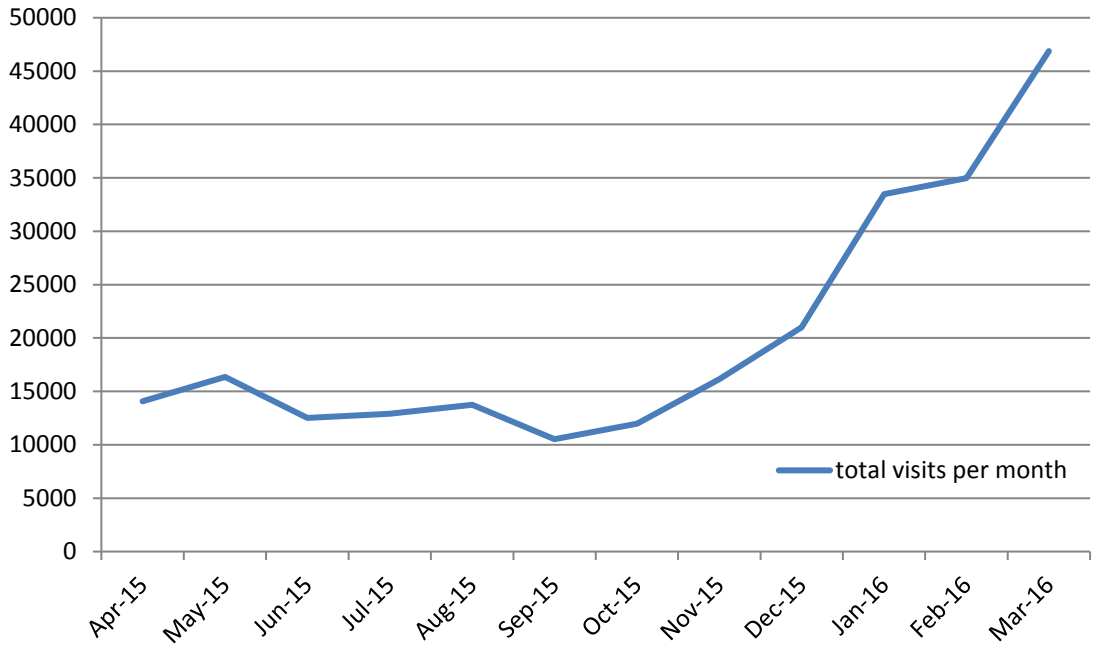


Figure 8: The total number of visits[1] per month to the MEDIN portal http://www.oceannet.org/finding_data/search/full during 2015-16

KT3.3 MEDIN made it easier to update UKDMOS content

A new procedure for updating the content of UKDMOS was developed during the year and was favourably received by a small number of users providing new content. The request for updates from existing users started towards the end of the financial year and feedback on the new process is not yet available.

Following feedback from the UK Marine Monitoring and Assessment Strategy (UKMMAS) Evidence Groups, MEDIN commissioned some development to the UKDMOS website and search interface. Work completed to date includes clarification on what is required to ensure the UKDMOS Web Map Service is INSPIRE compliant, additional information made available when content is exported from the search interface and bugs fixed with the search facility. A major redevelopment of the UKDMOS website and search interface was commissioned this year and is due to complete during Summer 2016. This will result in a more intuitive user interface as well a complete upgrade to the underlying technical systems.

In addition, other work completed in 2015-16 includes:

In response to a request by Defra, work was undertaken to identify datasets that could be included in the Defra Data Accelerator project, a project set up in response to the Secretary of State for the Environment announcing Defra was to make 8,000 new datasets openly available within a year. MEDIN took responsibility for confirming over 130 Defra owned datasets could be released under Open Government License and published to data.gov.uk. The MEDIN metadata records for these datasets have subsequently been modified and republished.

The transfer of portal code to BODC servers required extra input this financial year in terms of liaison with BODC IT staff and the undertaking of User Acceptance Testing.

On request, MEDIN are now able to create a MEDIN metadata record from the information

supplied in UKDMOS. This will allow MEDIN partners involved with marine monitoring to save time when producing MEDIN metadata describing the datasets collected during the monitoring.

Portal Deliverables Table 2015-16

Q1 Deliverables	Status	Commentary
Portal upgrade consultation with focus group	Achieved	Postponed to Q3. Contract let to Powered By Reason in November 2015. Full report available on the MEDIN website
UKDMOS update instructions sent out to Partners	Achieved	Postponed to Q4. Request sent out using the new form format.
Service metadata enablement by STFC	Achieved	
Operational tasks for Portal and UKDMOS	Achieved	Ongoing updates
Q2		
Service metadata enablement by BODC	Not achieved	Postponed to Q4. Require operational portal at BODC before changes can be made to the portal code to allow for service metadata. Subsequently to be included as part of the MEDIN portal upgrade specification.
Initiate metadata quality testing	Not achieved	Postponed due to other MEDIN work taking priority (Defra data accelerator). Obtained software from CEH used to quality test NERC records. Intention is to re-use this.
Operational tasks for Portal and UKDMOS	Achieved	Ongoing updates
Write spec for portal upgrade based on focus group	Not achieved	Postponed to 2016-17 due to delayed consultation with focus group.
Q3		
Commence portal upgrade/let contract	Not achieved	Postponed to 2016-17 due to delayed consultation with focus group.
Support partners in metadata quality improvements (after Q2 exercise)	Not achieved	Postponed to 2016-17 due to other MEDIN work taking priority (Defra Data Accelerator). Need to engage with DACs and partners to request their assistance to review metadata and issue instructions
Operational tasks for Portal and UKDMOS	Achieved	Ongoing updates
UKDMOS annual update request to partners	Achieved	Postponed to Q4 due to other MEDIN work taking priority. Request sent out using a new form format
Q4		
WS3 work plan for 2015/16	Achieved	
WS3 annual report for 2014/15	Achieved	
Operational tasks for Portal and UKDMOS	Achieved	Ongoing updates

WS4 International Awareness, Coordination and Data Delivery to Global Databases

WS4 ensures that UK developments are linked in and consistent with international initiatives, and that obligations to provide data to global data bases are met.

The following Key Targets were identified for WS4 for 2015-16:

KT 4.1 *Provision of feedback (via short reports) from international working groups (e.g. WG DIKE, MODEG, etc) illustrating how key European and international data initiatives impact on MEDIN. (Links to HLO3, HLO5)*

KT 4.2 *All near-real-time temperature and salinity data received by MEDIN passed on to the Global Telecommunications System. Increase in number of data suppliers. Deliver backlog of historical CTD data to international repositories (e.g. World Data Center for Oceanography (Silver Spring), ICES Data Centre and CLIVAR and Carbon Hydrographic Data Office (CCHDO)) (Links to HLO7)*

KT 4.3 *Review and update the report articulating the role of MEDIN within the broader range of UK and European data sharing initiatives. (Links to HLO3, HLO5)*

The Key Targets were partially met for WS4 as described below:

KT4.1 MEDIN participated in International Working Groups and Meetings

There was participation in a number of international working groups and meetings relevant to data initiatives and data management. These are detailed in the Delivery Table below.

KT4.2 MEDIN delivered near real-time data to the GTS.

This target was partially met. Near real-time data was routinely forwarded to the GTS, including over 300 CTDs from Marine Scotland Science, but there was no increase in the number of data suppliers. Delivery of the backlog of historical temperature and salinity data to international repositories was delayed due to other MEDIN work taking priority during the first part of the year. However, test datasets have been sent to ICES and the remaining available data have been prepared and are ready to send to ICES once confirmation is received from them.

KT4.3 MEDIN documented links to international initiatives.

This target has been met and a new version of the data initiatives document has been updated. It is available here (http://www.oceannet.org/library/key_documents/key_docs.html)

WS4 Deliverables Table 2015-16

Q1 Deliverables	Status	Commentary
Feedback from relevant European/ International Expert/Working Groups (KT4.1)	Achieved	Reviewed two EEA reports on Marine Protected Areas as UK National Resource Centre (NRC) for the European Environment information and Observation Network (EIONET); MSCC International Group / UK IOC Committee, 11 May; ICES Data and Information Group (DIG) – 18-20 May
Delivery of temperature and salinity data to the Global Telecommunication System (KT4.2)	Achieved	Data are routinely provided to the GTS from Marine Scotland (CTDs), Seal Tags and Argo floats
Establish priorities for engagement with European Initiatives (KT4.1, KT4.3)	Achieved	Planned which European initiatives to engage with in 2015-16.
Q2		
Feedback from relevant European/ International Expert/Working Groups (KT4.1)		No meetings attended this quarter
Delivery of temperature and salinity data to the Global Telecommunication System (KT4.2)	Achieved	Data are routinely provided to the GTS from Marine Scotland (CTDs), Seal Tags and Argo floats
Delivery of water bottle and CTD data to global data centres (KT4.2)	Partially achieved	Postponed to Q3. Delayed due to lack of staff resource. First submission ready.
Q3		
Feedback from relevant European/ International Expert/Working Groups (KT4.1)	Achieved	EuroGOOS/NOOS meeting to establish which UK data are required/used; Research Data Alliance (RDA) plenary meeting – sessions on accreditation of data repositories; active data management plans; marine data harmonisation and data rescue.
Delivery of temperature and salinity data to the Global Telecommunication System (KT4.2)	Achieved	Data are routinely provided to the GTS from Marine Scotland (CTDs), Seal Tags and Argo floats
Annual review and update of the international initiatives table (KT4.3)	Achieved	Completed in Q4. Delayed due to lack of staff resources.
Q4		
Feedback from relevant European/ International Expert/Working Groups (KT4.1)	-	No meetings attended this quarter
Delivery of temperature and salinity data to the Global Telecommunication System (KT4.2)	Achieved	Data are routinely provided to the GTS from Marine Scotland (CTDs), Seal Tags and Argo floats
Delivery of water bottle and CTD data to global data centres (KT4.2)	Partially achieved	Data ready; waiting for go ahead from ICES.
Annual review and update of the international initiatives table (KT4.3)	Achieved	Updated version available.
WS4 Work Plan for 2016-2017	Achieved	
WS4 Report for 2015-2016	Achieved	

WS5 Resources and Applications Development

WS5 defines and facilitates access to data services and products that meet the needs of MEDIN users. The Work Programme for 2015-16 fitted under the overall Business Plan for 2014-19.

The following Key Targets were identified for WS5 for 2015-16:

KT 5.1 *Development of a comprehensive catalogue of reference datasets including those available on SPIRE, identifying which are available as INSPIRE compliant web services, and which are important to derive higher level data including 'pressures data'. (KR3, DR14)*

KT 5.2 *Creation of technology and knowledge based resources (e.g. use cases, work instructions) that demonstrate how data mining and linking methods can be utilised to effectively discover and access data more easily and effectively. (KR3, DR14)*

KT 5.3 *Continue to develop the MEDIN Marine Gazetteer inter-operably with international bodies (marine) and Ordnance Survey (land) and to strengthen two key reference datasets, namely submarine cables and harbour areas, which MEDIN will also host, if required.*

The Key Targets were partially met for WS5 as described below. The shortfall was primarily due to delaying work in order to maximise the opportunity to improve access to reference datasets as part of the MEDIN portal redevelopment planned for 2016/17.

KT 5.1 MEDIN postponed updating the catalogue of reference datasets.

The MEDIN website contains a subset of web pages providing information on the availability of reference datasets. The planned update to the functionality and user interface was deliberately delayed as part of the MEDIN portal/website development and a review of the datasets is being undertaken. This also provided the advantage of being able to use some of the WS5 allocated funds on other MEDIN work.

The number of reference datasets available in view and download services provided by data owners, including the DACs, has increased since the Reference Data Action Plan was last issued. As part of the new design, these datasets will be accessible via the MEDIN portal. It is anticipated that users will be able to view these datasets as background maps in the portal and where appropriate use these datasets in searches.

KT 5.2 MEDIN delivered a case study demonstrating how datasets can be linked

Work on linking the United Kingdom Hydrographic Office's (UKHO) wrecks database to Historic England's (HE's) heritage database was delivered in Q2. A report was produced (available on the MEDIN website) and a workshop held with the Historic Environment DAC subgroup. The pilot web site which demonstrates how the datasets can be linked – and hence compared and used in data cleansing etc – is available (insert link). There was substantial interest from Scotland, Wales and Northern Ireland, all of which were willing to participate in future work. The aim is for HE (and the Devolved Administrations) to provide their own web services, rather than the proxy one used in this pilot, and hence to roll out the approach which has been demonstrated more widely. Note that a sister service is being provided to EMODnet under Lot 1 Hydrography Phase 2.

Many observation networks of interest to marine data users (e.g. CEFAS WaveNet) are accessed via individual bespoke websites. The OGC Sensor Web Enabled suite of standards allows users to access sensor data and use it in applications and websites via a common interface. Thus sensor data can be discovered and browsed in a similar manner to other web services. Rather than replacing existing networks, which is costly and impractical, during 2015/2016, MEDIN commissioned a pilot study to demonstrate how existing sensor networks can be converted using open source software to provide data services to this OGC standard. The project is expected to be completed by end Q2 2016/2017.

KT 5.3 MEDIN updated its Marine Gazetteer.

The MEDIN gazetteer has been partially updated (to version 3). The aim of providing a link between feature names in the MEDIN gazetteer and source data from the UKHO (which originates from nautical charts) is in progress and will allow the gazetteer to be more easily updated in future. The gazetteer has been compared with OS Open Names (which replaced the 1:50K gazetteer) and there is a plan to make the gazetteers compatible. As with OS Open Names it has also been suggested that links to popular international gazetteers e.g. GeoNames are provided. The content from the MEDIN Gazetteer is already feeding into the marine specific gazetteer published via marineregions.org but this link needs to be formalised. Completion of the gazetteer requires some of the core team's time and subject to approval is now planned for 2016 Q1.

The development of a definitive harbour area dataset has again stalled, primarily because of a lack of response from The National Archive (to provide a link to legislation) and Department for Transport (to act as dataset sponsor).

WS5 Deliverables Table 2015-16

Q1 Deliverables	Status	Commentary
Update Reference Layers webpage	Not achieved	Postponed to 2016/17 to take advantage of the redevelopment of the MEDIN portal. Funding diverted to other Work Streams which was welcomed due to a cut in overall sponsorship. The increase in available datasets from data owners as view and download services was noted.
EMECO Steering Group meeting	-	No meeting this quarter
Facilitate development of a wrecks reference layer	Achieved	Pilot study to create a web map service of wrecks including data from UKHO and Historic England delivered (http://wrecks.oceanwise.eu/). It was presented to the Historic Environment DAC Working Group in July 2015. Historic England and Historic Environment Scotland are being consulted about taking it further.
Q2		
Debug MEDIN Gazetteer	Achieved	Delayed due to lack of staff resource but completed in Q4.

Applications WG meeting	Not achieved	Postponed to 2016/17 Joint working group planned with Standards/DACs/Portal WG as a mega meeting. MEDIN mega meeting delayed until 2016-17 as MEDIN Open meeting took priority this year.
Q3		
In conjunction with BODC, make MEDIN gazetteer available as a linked dataset	Not achieved	BODC working on a spatial server that will enable MEDIN gazetteer to be made available as linked data but this will not start until June 2016 at the earliest due to other priorities at BODC.
Facilitate creation of a harbour area reference layer	Not achieved	Initial promising discussions with DFT (Paul Baden, GIS Manager) wrt to DFT being dataset sponsor petered out. No response also received from TNA wrt link to legislation.
Provide OGC Sensor Web Enablement pilot utilising existing	Partially achieved	This work has started and is due to be completed 2016 Q2. Cefas proposed demonstrating how sensor data from existing network can be published to a common standard and how this can be used to make sensor data more widely accessible (including via Machine to Machine transfers) from private and public networks thus aiding integration.
Q4		
WS5 Work Plan for 2016-17	Achieved	
WS5 Annual Report for 2015-16	Achieved	

WS6 Communications: Outreach, forums, publicity

Communications and outreach are key activities for MEDIN as it is essential to communicate to the marine community the resources that have been developed, to provide advice and support on how to use them, and to receive feedback on the utility of these resources. The Work Programme for 2015-16 fitted under the overall Business Plan for 2014-19.

The following Key Targets were identified for WS6 for 2015-16:

KT 6.1 *Increase profile of MEDIN in the academic and private sectors*

KT 6.2 *Work more closely with Partners to publicise MEDIN*

KT 6.3 *Publish 4 issues of MEDIN Newsletter*

KT 6.4 *Increase profile of the Discovery Portal and MEDIN website*

The Key Targets were met for WS6 as described below:

KT6.1 and KT6.2 MEDIN attended and hosted a range of conferences and meetings.

Key targets 6.1 and 6.2 have been achieved as the profile of MEDIN has been boosted this year by representation at several conferences and forums, including Coastal Futures and IMarEST Oceans of Knowledge. MEDIN has also run events this year such as the MEDIN Open Meeting (formally the Partners Meeting) and the MEDIN Hack Day.

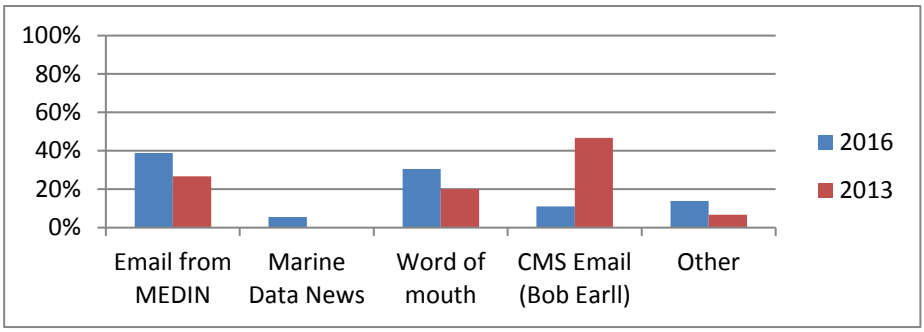
MEDIN Core Team members were invited speakers at conferences such as Marine Conservation – Sink or Swim?

Held in February entitled The Industry Marine Data Revolution, the Open Meeting attracted interest from across the marine community and was attended by over 60 delegates.

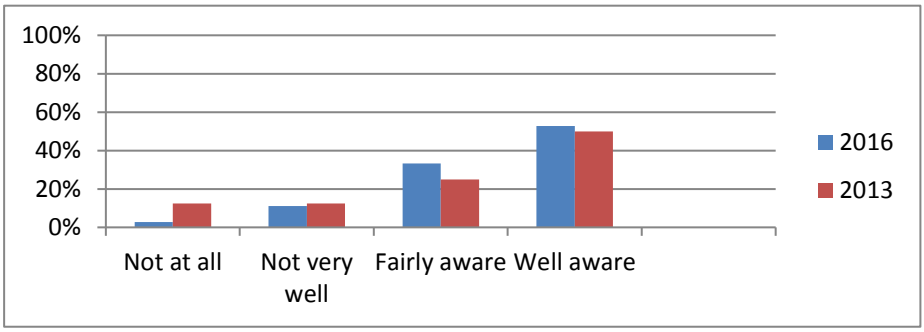
Organisations that attended MEDIN Open Meeting, 9th February 2016	
ABPmer	Marine Biological Association of the UK (MBA)
APEM Ltd	Marine Management Organisation (MMO)
Bangor University	Marine Programme, United Nations Environment Programme - World Conservation Monitoring Programme
Blue Marine Foundation	Marine Scotland Science (MSS)
British Geological Survey (BGS)	MarineSpace Ltd
Centre for Environment, Fisheries and Aquaculture Science (Cefas)	National Biodiversity Network
Centrica - Distributed Energy and Power	National Oceanography Centre
CG Metocean Consulting	Natural Resources Wales
Department for Environment, Food & Rural Affairs (Defra)	OceanWise Ltd
DONG Energy Wind Power	Offshore Renewable Energy (ORE) Catapult
EGS (International) Ltd	Scottish Power Renewables (SPR) Offshore
European Marine Energy Centre Ltd (EMEC)	Seafish
Gardline Environmental Limited	SSE
GeoData Institute	The Crown Estate
Heriot-Watt University	Total
Historic England	United Kingdom Hydrographic Office (UKHO)
Historic Environment Scotland	University of East Anglia
IIC Technologies Ltd	University of St Andrews
Joint Nature Conservation Committee (JNCC)	Vattenfall
Lloyd's Register	Wessex Archaeology

The Open Meeting was well received and generated interesting ideas in the afternoon discussion groups, which considered the motivations for sharing marine data and whether MEDIN's current funding model would be appropriate for helping facilitate the sharing of industry data. Feedback from the event is summarised in figure 9 and shows that all attendees found the main session useful or relevant.

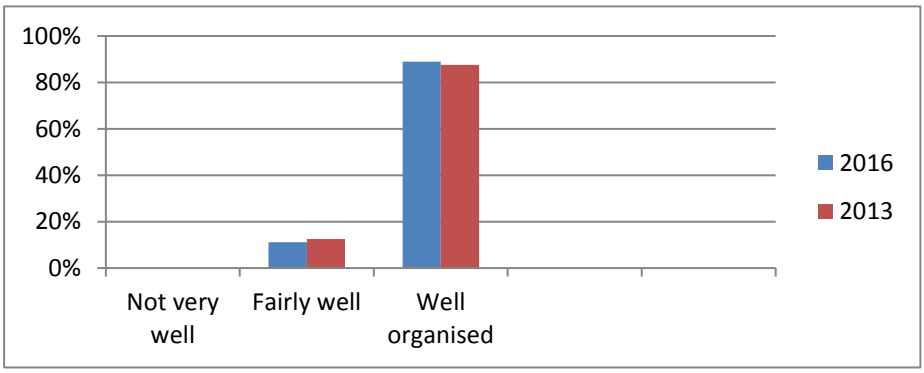
1. How did you hear about this event?



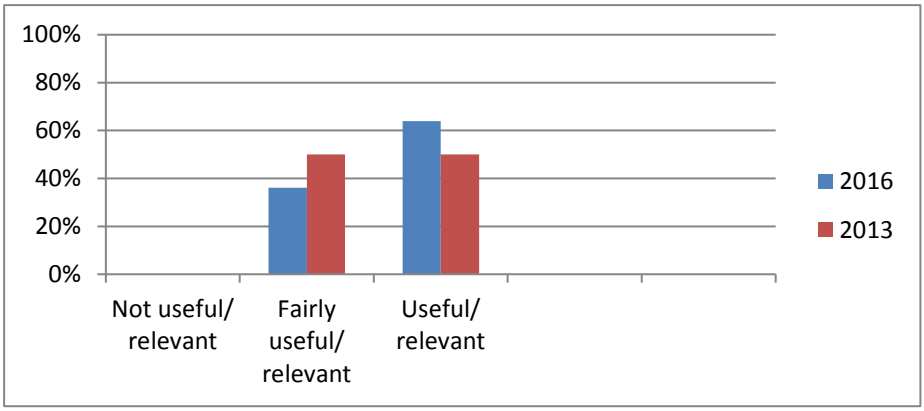
2. To what degree were you already aware of the work MEDIN does before attending the event?



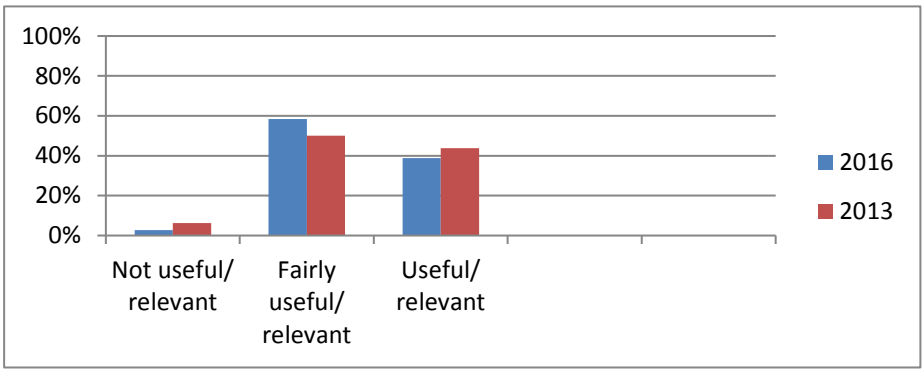
3. How organised was the event?



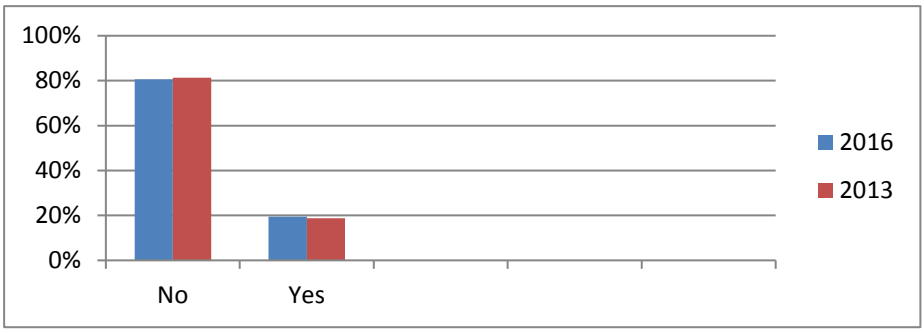
4. How useful/relevant were the issues dealt with in the MAIN SESSION to your organisation?



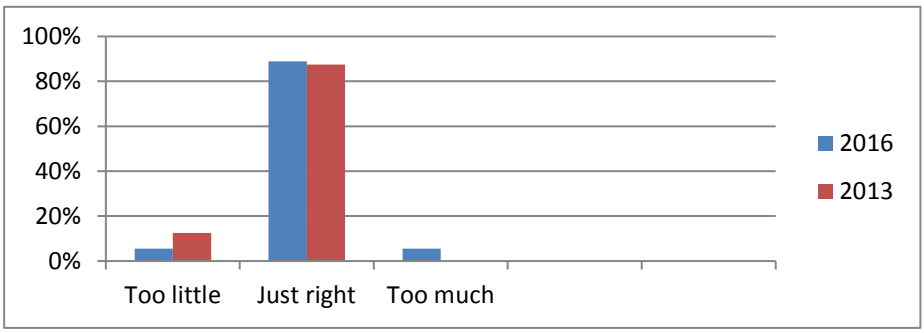
5. How useful/relevant were the issues dealt with in the BREAK-OUT SESSION to your organisation?



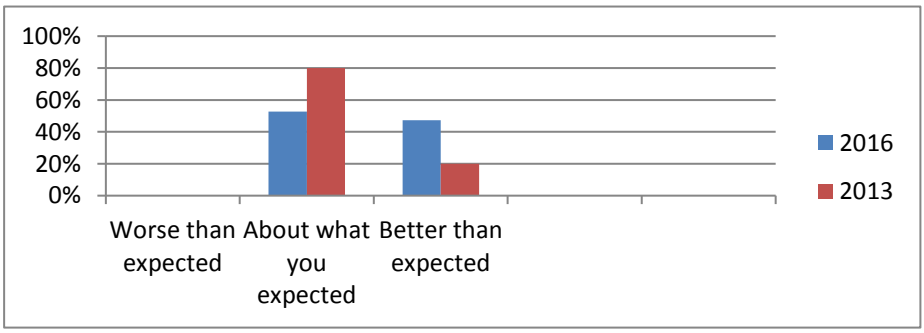
6. Were there any issues not dealt with at the event that you would've liked to have seen addressed?



7. How do you feel about the amount of time given to presentations?



8. How did the event meet your expectations?



9. And finally, overall how satisfied were you with the event?

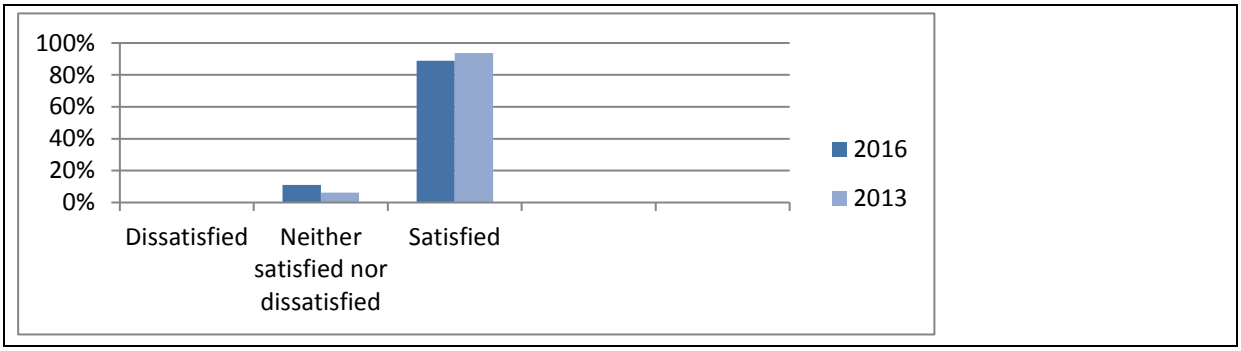


Figure 9: Feedback from the MEDIN Open meeting 2016 (62 attendees of which 36 provided feedback), compared with the MEDIN Partners meeting held in 2013 (64 attendees of which 16 provided feedback).

KT6.3 MEDIN published 4 issues of Marine Data News

MEDIN's online newsletter is known as **Marine Data News.** Four issues were published this financial year and are all available for viewing on the MEDIN website (http://www.oceannet.org/marine_data_newsletter/) so key target 6.3 was achieved. There are currently 579 subscribers to Marine Data News, including 36 new subscribers and 14 unsubscribers. A small decrease in total subscribers since last year is due to the automatic removal of email address that 'hard bounce' from the mailing list.

Following the move to a web based email marketing service for Marine Data News, MEDIN have access to an automatically compiled statistical analysis. The figures recorded in table 6 are accurate as of the 14th April 2016 and figures for issue 32 are expected to increase further. The number of recipients who opened the newsletter has increased over the year implying that more readers are interacting with it.

Issue number	***29***	***30***	***31***	***32***
Date	Jun-15	Sept-15	Dec-15	Apr-16
Overall Stats				
Total Recipients:	590	591	586	589
Successful Deliveries:	572	569	570	567
Bounces*:	18	22	16	22
	16 soft, 2 hard	8 soft, 14 hard	7 soft, 9 hard	7 soft, 15 hard
Recipients Who Opened:	131	132	134	128
Total Opens:	784	422	423	628
Last Open Date:	05/04/15	24/03/16	01/04/2016	13/04/2016
Recipients Who Clicked:	39	44	18	23
Total Clicks:	136	80	21	28
Last Click Date:	03/07/2015	03/01/2016	08/02/2016	12/04/2016
Total Unsubscribes:	4	0	0	0
EepUrl clicks *(twitter)*	429	257	239	231

Table 6: Summary of Marine Data News electronic distribution and user interaction.
**** Soft bounce**: Temporary delivery issue, such as the recipient's inbox is full, their server is down, they're on vacation and have set up their email set to away. MailChimp will try sending to that address again, but will clean a soft bounce after five failed sends.*
***Hard bounce**: Email cannot be delivered. When a hard bounce happens, MailChimp will remove the address permanently from your list into the cleaned section.*

On the release of Issue 32 it was discovered that MailChimp, the online email campaign builder used for the creation and distribution of Marine Data News, was suffering from a technical fault. This fault prevented 'read more' links within the newsletter from working

properly. To ensure that subscribers were able to read the full content of the newsletter whilst the issue was being resolved a PDF version of the newsletter was sent out. As a result of this the statistical analysis provided by MailChimp for this issue may not be an accurate representation of the performance of the newsletter. The issue was resolved by MailChimp and the online version of this edition of Marine Data News is now fully functioning.

MailChimp now allows the integration of google analytics which enable subscribers interacting with oceannet.org from the newsletter to be tracked, The newsletter has generated 59 oceannet.org sessions, 46% of which were new sessions and 27 of the visitors were new visitors..

KT6.4 MEDIN succeeded in increasing its focus on finding data

MEDIN continually seeks to update and improve the oceannet.org website in order to increase its effectiveness. MEDIN's main website is available at http://www.oceannet.org/. Website statistics for the past 7 years are shown in table 7. Although there has been a decrease in the overall number of visits to the site and the number of visitors (number of unduplicated visitors to the website over the specified period of time) there was a small increase in the ratio of sessions used by new users compared to existing users. This indicates MEDIN is continuing to attract new audiences via its website.

Period	*Number of Sessions*	*Number of Users*	*Page views*	*Unique Page views*	*% new sessions*
FY09/10	8,494	4,907	28,046	21,826	55.80%
FY10/11	11,057	6,954	30,371	24,349	60.55%
FY11/12	12,547	6,767	43,415	34,431	55.79%
FY12/13	12,412	7,157	41,391	31,833	56.03%
FY13/14	13,736	7,590	62,276	37,276	52.82%
FY14/15	12,638	7,324	49,425	27,163	55.82%
FY15/16	10,737	6,455	42,845	22,112	58.07%

Table 7: Summary of use of MEDIN website www.oeannet.org for past 7 years.

The top eight pages (as measured by the number of times a page was viewed) are shown in figure 10 for FY2015-16 and compared with the previous 2 financial years. Whilst the overall trend is a decline in visitor numbers, the number of visits to the 'finding data' page has more than doubled in the past 2 years indicating that more visitors are using the website as a source to find marine data.

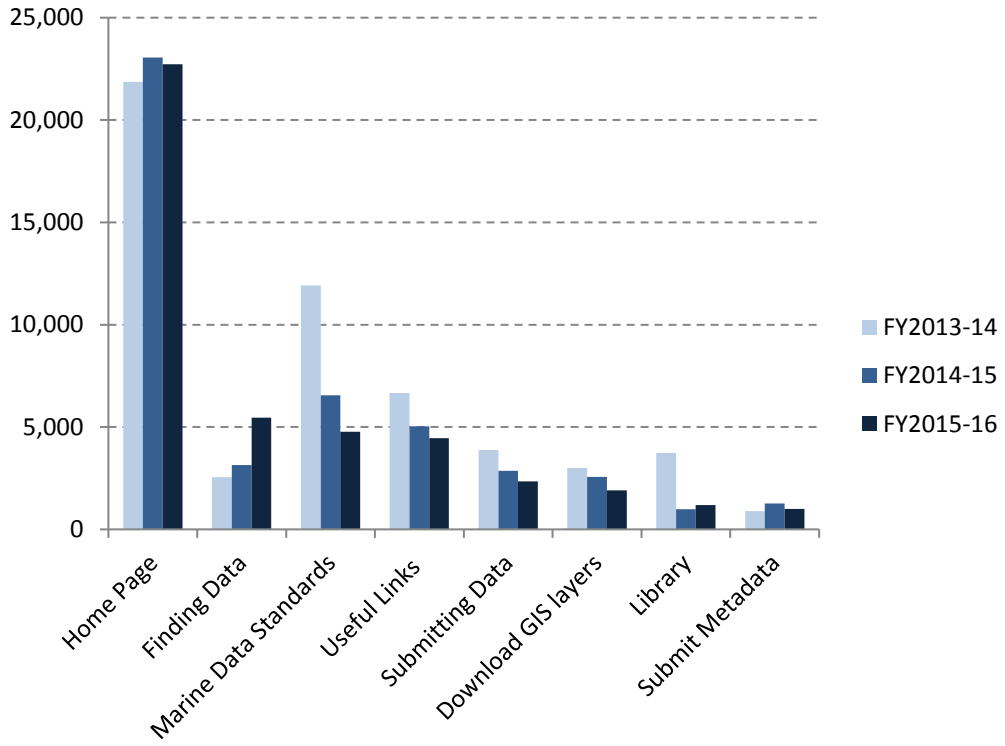


Figure 10: Number of page views for 8 of the MEDIN webpages for the past 3 years.

In addition, other work completed in 2015-16 includes:

The MEDIN twitter account (@MEDIN_marine) is followed by over 702 organisations and private individuals interested in marine science and data, an increase of 182 followers from last year. This represents a two-way communications outlet with the potential to reach a global audience. Additions to the website as well as other general announcements are broadcast on twitter using free scheduling software Hootsuite to ensure tweets are sent at a time most likely for them to be read.

WS6 Deliverables Table 2015-16

Q1 Deliverables	Status	Commentary
1 edition of Marine Data News	Achieved	Issue 29 sent out June '15
Plan partners meeting	Achieved	Meeting format, speakers and venue planned. Meeting held February 2016
Website review	Achieved	DAC webpage update planned and agreed with DAC Working Group. More general update to whole site to be done in conjunction with portal upgrade.
Plan outreach to academic and commercial sector organisations	Achieved	Material collated and in discussion with School of Ocean and Earth Science, University of Liverpool. Also collaborating with The Crown Estate to ensure maximum exposure. Dates to be finalised.

Develop video promotional material on using MEDIN portal	Achieved	Deliverable amended so that PowerPoint presentation is being used instead of video. Benefits for this are:(i) Quicker to make, amend and maintain keeping it up to date, (ii) Easier for the end user to navigate and share, (iii) More interactive (iv) Smaller in size so easier and quicker to load on website or any other hosting site (e.g. SlideShare, LinkedIn). 1st version displaying MEDIN highlights available.
Q2		
1 edition of Marine Data News	Achieved	Issue 30 sent out Aug '15
Partners meeting	Achieved	Executive Team renamed this an "Open Meeting" and postponed meeting until February. Meeting was focued on access to industry data. The meeting was oversubscribed and positive feedback received.
Website maintenance and update	Achieved	Ongoing task throughout the year.
Visit 1 x commercial organisation	Achieved	Meeting with Cefas (50% commercial) in Q4
Visit 1 x academic institute	Not achieved	Delayed due to other MEDIN work taking priority.
Q3		
1 edition of Marine Data News	Achieved	Issue 31 sent out Dec'15
Website maintenance	Achieved	Ongoing task
Write and submit article to journal	Not achieved	Currently liaising with IMAREST to provide input to write up for Oceans of Knowledge event. In communication with Planet Earth regarding the publication of article on the MEDIN Portal.
Visit 2 x commercial organisation	Achieved	Networking at IMAREST Oceans of Knowledge conference increased links with Port of London, Shell, RES Offshore.
Visit 1 x academic institute	Not achieved	Delayed due to other MEDIN work taking priority.
Q4		
1 edition of Marine Data News	Achieved	
Website maintenance	Achieved	
Visit 1 x commercial organisation	Achieved	Networking at Coastal Futures, and industry focused Open Meeting.
WS6 Work Plan 2016-17	Achieved	
WS6 Report on 2015-16	Achieved	

WS7 Management, Planning and Coordination

Work Stream 7 covers the management, planning and coordination activities as provided by the core team based at BODC, with the support of the MEDIN Executive Team. This includes the organisation of MEDIN Executive Team meetings, quarterly and annual reporting, and the production of an annual work programme. The management, planning and coordination of MEDIN continued as planned.

2015-16 was the second year of the 2014-19 Business plan. Although, the MEDIN review in 2013 recommended that sponsors take a longer term approach to funding MEDIN, some funding agreements remain one year in duration and consequently needed renewing.

The following Key Targets were identified for WS5 for 2015-16:

KT 7.1 *Provide support to Government in Key Policy Areas (Links to* ***HLO5****)*

KT 7.2 *Embed Use of MEDIN by Partners (Links to* ***HLO1, HLO8****)*

KT 7.3 *Establish activity to provide Cost / Benefit examples for use of MEDIN (Links to* ***HLO9****)*

KT 7.4 *Engage New Sponsorship (Links to* ***HLO10****)*

These targets were met for WS7 as described below:

KT7.1 MEDIN worked with its Government partners.

MEDIN has again worked closely with the UK Marine Monitoring and Assessment Strategy (UKMMAS) community:

- A key requirement on MEDIN in support of UKMMAS is to develop plans for data management and setting up data transfer arrangements in support of the UK implementation of the European Marine Strategy Framework Directive (MSFD). MEDIN is an active participant in a Data Task Group, chaired by DEFRA and Marine Scotland, that has been set up to help implement this.
- MEDIN is represented at all the UKMMAS evidence groups with Dan Lear (DASSH) supported to represent MEDIN at the Healthy and Biodiverse Seas Evidence Group, andMike Osborne (OceanWise) supported to represent MEDIN at the Productive Seas Evidence Group.
- Dr. Clare Postlethwaite attends meetings of MARG and Dr. Lesley Rickards is on the Executive Committee for the UK Integrated Marine Observation Network.

Engagement with MSCC has continued. MEDIN now has a seat on MSCC and official MEDIN representation is provided by Prof. Peter Liss, the Chair of the MEDIN Sponsors' Board and Executive Team or Dr. Clare Postlethwaite, MEDIN Co-ordinator. Progress reports are provided to the 6 monthly meetings and MEDIN, along with other smaller MSCC sub groups, are now required to report via MARG. Mike Osborne (OceanWise) is supported to represent MEDIN at the Marine Industry Liaison Group, which is looking at a high level how access to industry data can be improved, and Dr Gaynor Evans attends the Underwater Sound Forum.

MEDIN continues to engage closely with the data.gov.uk initiative to coordinate input from

the marine community, and to ensure that the MEDIN and data.gov.uk resources developed for publishing data and metadata are consistent and linked.

MEDIN welcomed the increased focus on open access to data within Defra this year and have actively contributed to the Defra data accelerator project, continuing to push metadata to data.gov.uk on request and archive Defra funded data within the MEDIN network. A wide range of Defra data are archived at 6 of the 7 MEDIN DACs,

KT 7.2 MEDIN worked to better understand the needs of its industry partners.

Significant activity looking at ways to improve access to industry data has continued this year. In particular, a Review of Access to Industry Marine Environment Data (ref) was published in Dec 2016. This work was co-funded by MEDIN, the Marine Management Organisation, Marine Scotland and The Crown Estate. MEDIN expanded on this work by targeting its annual Open Meeting at the commercial sector to highlight how MEDIN can safeguard data for industry.

KT7.3 MEDIN reported the range of industry requirements to re-use data

Recent studies commissioned by the Offshore Renewable Energy (ORE) Catapult produced lists of the data used by different marine industries. Moreover a report commissioned by the Productive Seas Evidence Group (PSEG), co-funded by MEDIN, identifies where data collected by a range of marine industries have the potential to be used to help meet public sector requirements. Table 8 highlights where data are being re-used (i.e. were collected by someone else) during the various stages of a Wind Farm Development. Similar information is available for Inter Array Cable Installation.

Wind Farm Developments							
Stage	Met Ocean	Bathymetry	Geology and Geophysics	Species and Habitats	Oceanography	Archaeology	Fisheries
Initial	Re-use	Re-use	Re-use	Re-use	Re-use		Re-use
Consenting	Re-use		Both	Both	Both	Both	Both
Design	Both	Both	Both	Both	Both	Both	Both
Construction	Both	New	New		Both		
Operational	Both	New	New	Both	Both		Both
Decommissioning	Both			Both	Both	Both	Both

Table 8: The type of data required at each stage of a wind farm development. 'New' indicates where the industry exclusively requires new data collection, 'Re-use' indicates where the industry exclusively re-users data collected by others and 'Both' indicates where new data collection is combined with re-use of data collected by others.

The types of data held by the accredited MEDIN Data Archive Centres are all required at some point of an offshore wind farm development. At the initial stages of development, data is exclusively being re-used from other sources. As the development progresses through the consenting and design stages, new data is collected but data from other sources continues to be required. It is only during the construction and operational phase that the developers rely exclusively on newly collected data for bathymetry and geology measurements.

KT7.4 MEDIN secured additional sponsorship

MEDIN are delighted to welcome the Centre for Environment, Fisheries and Aquaculture Science (Cefas) as their 16th Sponsor. Cefas sponsorship will start in April 2016 and will initially last 3 years.

WS7 Deliverables Table 2015-16

Q1 Deliverables	Status	Commentary
Exec Team Meeting	Achieved	21/05/2015
Renew Sponsorship agreements for 2015-16	Achieved	MoU signed by MSCC and NERC. NRW, HR Wallingford, MMO, AFBI, DOENI all needed to renew
MARG meeting	Achieved	19/05/2015
OPEG meeting	Achieved	01/04/2015
IMON Meeting	-	No meeting this quarter
Paper on Key priorities for MEDIN in 2014-19	Achieved	Included as update to MSCC September meeting.
Meeting with EA	Achieved	Meeting held in November.
Meeting with licensing bodies to discuss how to increase access to data collected for licensing.	Not achieved	Other MEDIN work took priority.
Q2		
Sponsors Board (Focus on Annual Report)	Achieved	19/11/2015
Paper to MSCC	Achieved	Update submitted for September meeting
MILG, IMON, MARG, MSCC meetings	Achieved	MILG meeting cancelled, No IMON or MARG meeting this quarter, MSCC 30/9/15
Meeting with MMO	Not achieved	Other MEDIN work took priority.
Arrange meeting with 1 private sector organisation	Achieved	CP promoted MEDIN at marine industry event in Liverpool 29/9/15
Exec Team Meeting	Achieved	22/09/2015
Paper on Key priorities for MEDIN in 2014-19	Achieved	Included as update to MSCC September meeting.
Q3		
MILG, IMON and MARG meetings	Achieved	MILG September 2015, MARG 17th November 2015. No IMON meeting this quarter.
OPEG meeting	Achieved	Oct-15
Meetings with Scottish agencies and NI agencies	Partially achieved	Met with Historic Scotland Feb 2016 but other MEDIN work took priority.
Exec Team Meeting	Achieved	03/12/2015
Arrange meeting with 1 private sector organisation	Achieved	Networking at IMAREST conference "Oceans of Knowledge" - renewed MEDIN contact with Port of London, Shell, RES Offshore.
Update and republish the Data Strategy	Achieved	Data Strategy re-published by end Q4.
Meeting with EA	Achieved	Meeting held in November.
Sponsors Board (Focus on Annual Report)	Achieved	19/11/2015
Q4		
Sponsors Board (Focus on Work Plan)	Achieved	31/03/2016
MILG, IMON and MARG meetings	Achieved	10/02/2016
Arrange meeting with 1 private sector organisation	Achieved	Networking with ~20 commercial organisations at MEDIN Open meeting

Exec Team Meeting	Achieved	29/02/2016
Work Plan for 2015-2016	Achieved	
Annual Report for 2014-2015	Achieved	