

NERC Environmental Data Service (EDS)
Dodona Operational Service

Market Engagement Day

Friday 20 October 2017

The Westminster Conference Centre
1 Victoria Street, London



NERC's vision for environmental data

Professor Tim Wheeler
NERC Director, Research & Innovation



**NERC is an
organization
built on data**



NERC's data assets

- NERC holds 10 to 15 petaBytes (PB) of environmental data
 - That is, up to 15,000,000,000,000,000 bytes and doubling every 2.5 years
-



- Centre for Environmental Data Analysis (Atmospheric and Earth Observation)



- National Geoscience Data Centre



- British Oceanographic Data Centre



- UK Polar Data Centre



- Environmental Information Data Centre (Terrestrial & Freshwater)



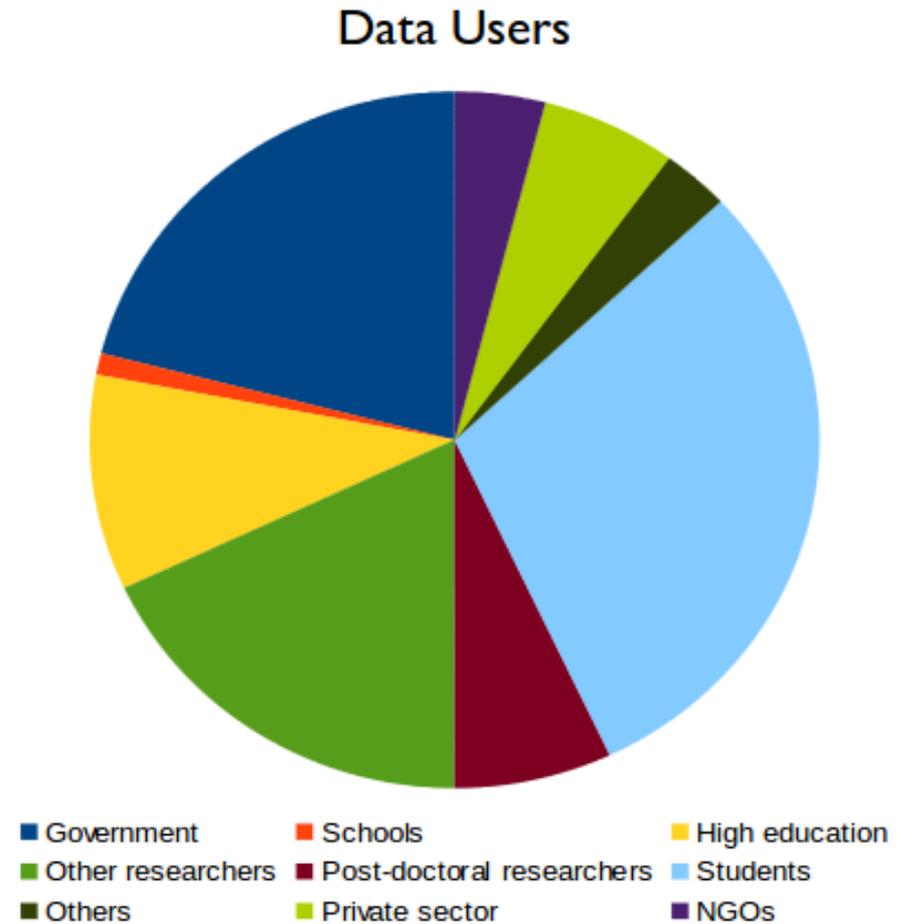
NERC's data services are highly valued and used

For example, The Centre for Environmental Data Analysis hosts climate, socio-economic and environmental data from the IPCC that was accessed >11.8 million times in 2014/15

However, only a small fraction of data is accessed by those outside the research community

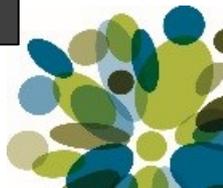
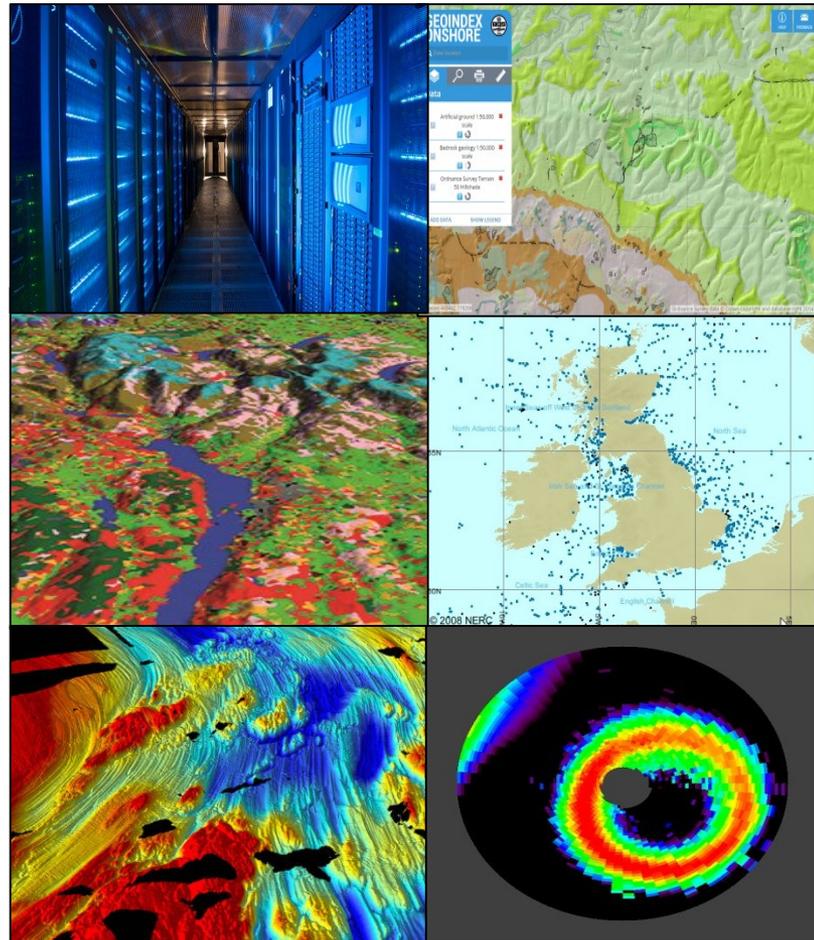
Deloitte analysis quantifies *'the direct value of Public Sector Information at around £1.8bn with wider social and economic benefits taking that up to around £6.8bn'*

Shakespeare Review 2013



Our vision for environmental data

To create a unified NERC data service to better understand Planet Earth by advancing science and realising benefits to users through environmental data



How we will achieve this?

Through creating a Dodona Environmental Data Service that brings together the demands of data users with the activities and outputs of NERC's Data Centres and its Innovation Programmes

The EDS will have two primary objectives:

1. To bring NERC's and other data assets and expertise to bear to solve user-defined problems which are often multi-disciplinary, complex and do not map easily onto the expertise of a single data centre
2. To realise new data applications and advances in science by combining NERC data with non-NERC data from any source or discipline



What are the building blocks of the EDS?

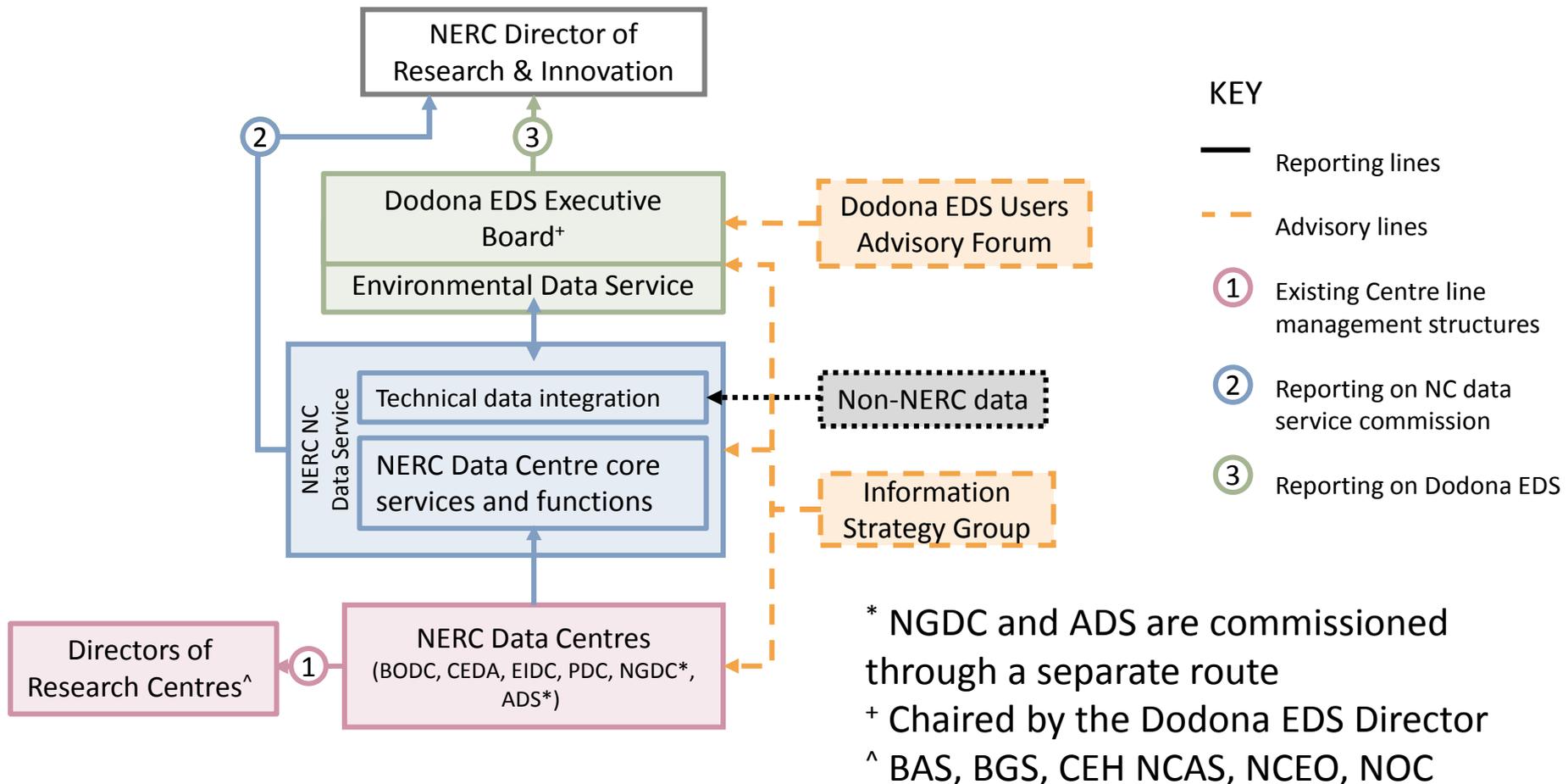
The Dodona EDS will create an overarching framework to provide access to NERC data, to broker user engagement with the data, to identify challenges and to help in direction of funding towards defined innovation programmes, and will be comprised of three main pillars:

- A Dodona Operational Service and Data Innovation Portal (the subject of this Prior Information Notice), which will support and co-ordinate the delivery of the Dodona EDS including through a technical platform that will provide a preferred (but not exclusive) point of access into NERC data holdings (£1.95m)*
- Technical data integration activities under the management and direction of the NERC Data Centres (£1.84m)*
- NERC's data innovation programmes, under the management and direction of NERC Head Office (£6.39m)*

**Figures exclude VAT and indicate spend between 2018/19 and 2022/23*



Governance and reporting for the NERC Data Service



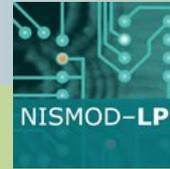
This diagram shows the NC **Data Service commission (blue)** in relation to **existing activity (red)** and proposed **activity of the Dodona EDS (green)**

Internal



External

NERC Data Centres



'Environment space'

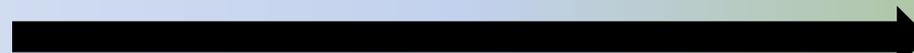
Working with other data hubs

Single organisation



Multi-organisational

Single discipline



Multi-disciplinary

NERC Environmental Data Centres (EDCs)

EDCs, the range of environmental data and some examples of previous activities and exploitation

Garry R. Baker

Chair of NERC Data Operations Group

Head of National Geoscience Data Centre (NGDC)



NERC Environmental Data Centres

- National Geoscience Data Centre (**NGDC**)
- Centre for Environmental Data Analysis (**CEDA**)
- Environmental Information Data Centre (**EIDC**)
- Polar Data Centre (**PDC**)
- British Oceanographic Data Centre (**BODC**)



Geoscience / Sub-surface



Atmosphere / Solar System
Earth Observation



Terrestrial / Freshwater



Polar - regional



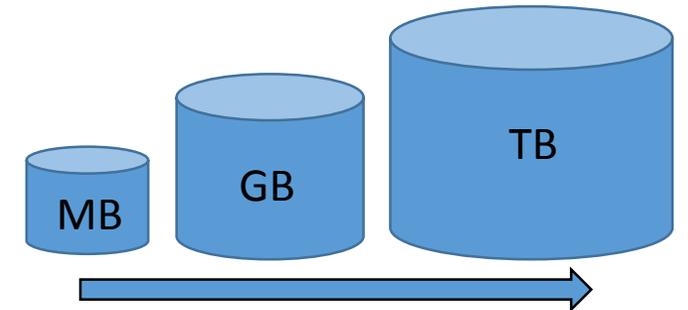
Oceanography / Marine

Types of Data held in EDCs

Range of data created in support of NERC funded environmental science, including academic sector grants, the NERC research centres or data acquired from voluntary and/or statutory data donations

Data Types:

- Historical and most often unique environmental observations and interpretations
 - These are in a multitude of digital data formats (as driven by science)
 - Data formats: NETCDF, XLS, CSV, DAT, plus a wealth of standard office and proprietary formats
 - Scanned or digitised images (derived from analogue data sources)
 - 3D scanned objects
- Models (model input, code, output, simulations)
- Sensor network or data streams (monitoring sites)



Some data stored 'as is', some amalgamated into data stores or databases

Current Users for NERC data

- Domain communities
 - National; Countryside Survey, Global; OneGeology, GEBCO
- Environmental communities
 - European networks; ESFRI, PEER
- Academia
 - Researchers, students
- Other research institutes
 - Met Office, NSRI
- Business
 - Insurance or Oil service companies
- Government
 - large infrastructure projects or Civil Contingencies
- Overseas Development
 - UN, African Union, NGOs; MapAction
- Public
 - Citizen science, general interest

Key Mechanisms the Data Centres Engage

- Web
- Papers/ Data journals
- Networks
- Apps
- Computer to computer
- Standards
- Data laboratories/ Science Gateways

Web interfaces

The screenshot shows the OneGeology Portal web interface. The browser address bar displays `portal.onegeology.org/OnegeologyGlobal/`. The page features a navigation bar with the OneGeology logo and the tagline "Providing geoscience data globally". A toolbar contains various icons for map navigation and layer management. The main content area displays a world map with colored regions representing different geological data layers. The map is labeled with "NORTH PACIFIC OCEAN", "NORTH ATLANTIC OCEAN", "SOUTH PACIFIC OCEAN", and "SOUTH ATLANTIC OCEAN". At the bottom of the map, there is a scale bar showing 4000 km, a scale dropdown set to "1 : 112 500 000", a coordinate system dropdown set to "SRS : 2D Latitude / Longitude (WGS84)", and coordinate values "X : 195.73" and "Y : 195.73".

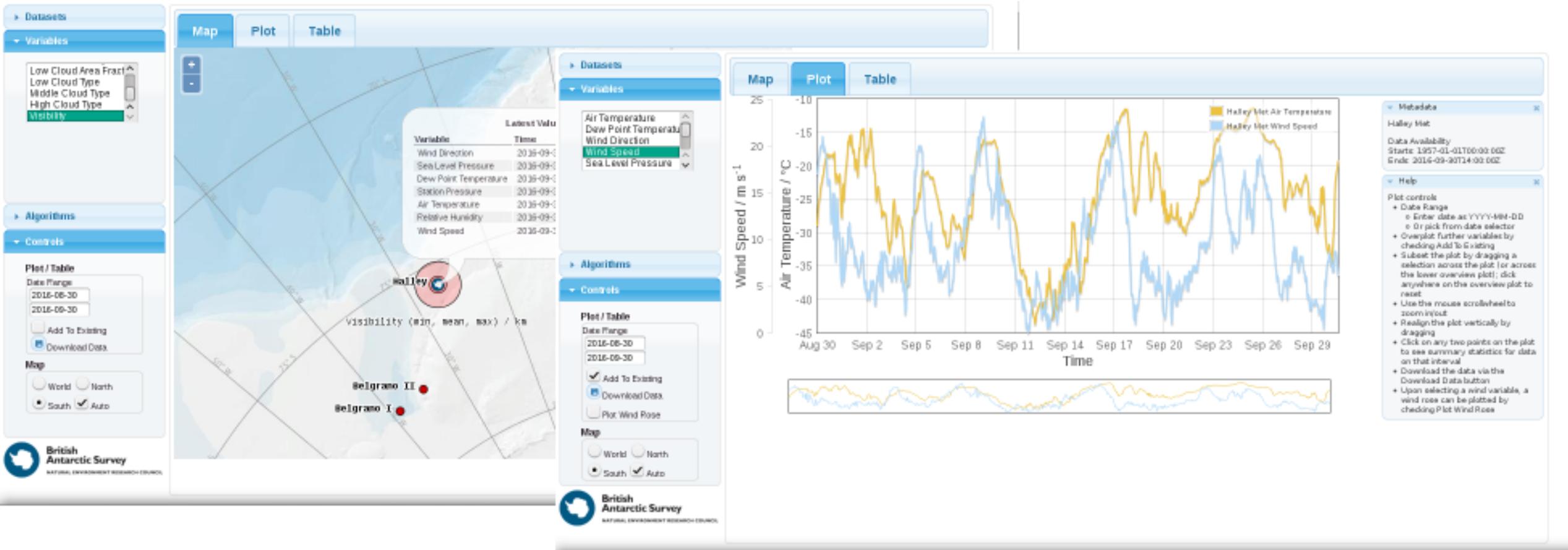
Open Geospatial Consortium:
WMS, WFS, WCS

The screenshot shows the MINERALS4EU web interface. The browser address bar displays `portal.onegeology.org/OnegeologyGlobal/`. The page features a navigation bar with the MINERALS4EU logo and the tagline "Providing geoscience data globally". A toolbar contains various icons for map navigation and layer management. The main content area displays a detailed map of Europe with colored regions representing different geological data layers. An information popup is visible over the map, displaying details for a specific mine. The popup text includes: "Mine FRA-00220 (France)", "Villeneuve, Contain(Tr): Villeneuve", "not operating - A mine is not operating [...]", "Mining activities and associated products:", "• underground mining; unknown treatment; 30 t", "• antimony; 30t", "• gold; 0t", "Document citations:", "Remark: Mine FRA-04101 (France)".

The screenshot shows a web interface with a map of Tunisia. The map is titled "Tutoriel" and displays a network of roads and other geographical features. The interface includes a navigation toolbar and a sidebar with various controls and information.

The screenshot shows a web interface with a map of Savoie. The map is titled "Inventaire des zones humides de la Savoie" and displays a network of water bodies and other geographical features. The interface includes a navigation toolbar, a legend, and an information panel.

Web interfaces: built upon Open Geospatial Consortium compliant services: mainly WMS, SOS





Data

Home



Warning: data currently displayed is provisional only, and has not yet undergone quality assurance



Site name	Land cover	Soil type
Morley	Arable	Loam to
North Wyke	Grassland/Pasture	Loam to
Plympton	Semi-Natural Grassland	Loam
Porton Down	Grassland	Chalky, S
Redmere	Shallow Arable	Peat
Redhill	Improved Grassland	Sand to
Riseholme	Improved Grassland	Shallow
Rothamsted	Crops and Grassland	Clayey L
Sheepdrove	Grassland	Chalky S
Sourhope	Coarse Grassland	Loam to Sandy Loam
Stoughton	Arable	Loam to Clayey Loam

Layers Legend

Environmental baseline monitoring in Lancashire - Real-time data and data summaries

NEC: 354000, 444000

SWC: 326000, 421000

aerial street bedrock geology superficial geology radon groundwater sensors groundwater quality surface water quality air quality seismic stations

Key to 1:625 000 bedrock geology

- Area description
- Air quality
- Groundwater sensors**
- Groundwater quality
- Ground motion
- Surface water quality
- Methane baseline
- Radon baseline
- Seismic monitoring

Groundwater sensors

We are currently monitoring 6 parameters at 5 sensor locations in the Lancashire area

These data are provided live to the website. No quality assurance or data validation has been carried out and the data may include anomalies related to sensor maintenance, calibration or malfunction. Final validated datasets may be subject to change.

Select a measurement to plot the latest data	Units
Water Temperature	°C
Barometric pressure	hPa
Total dissolved gas (TDG)	hPa
Specific electrical conductance (SEC)	µS/cm
pH	
Offset water depth	m

NERC Data Centres and Data Citation

We have:

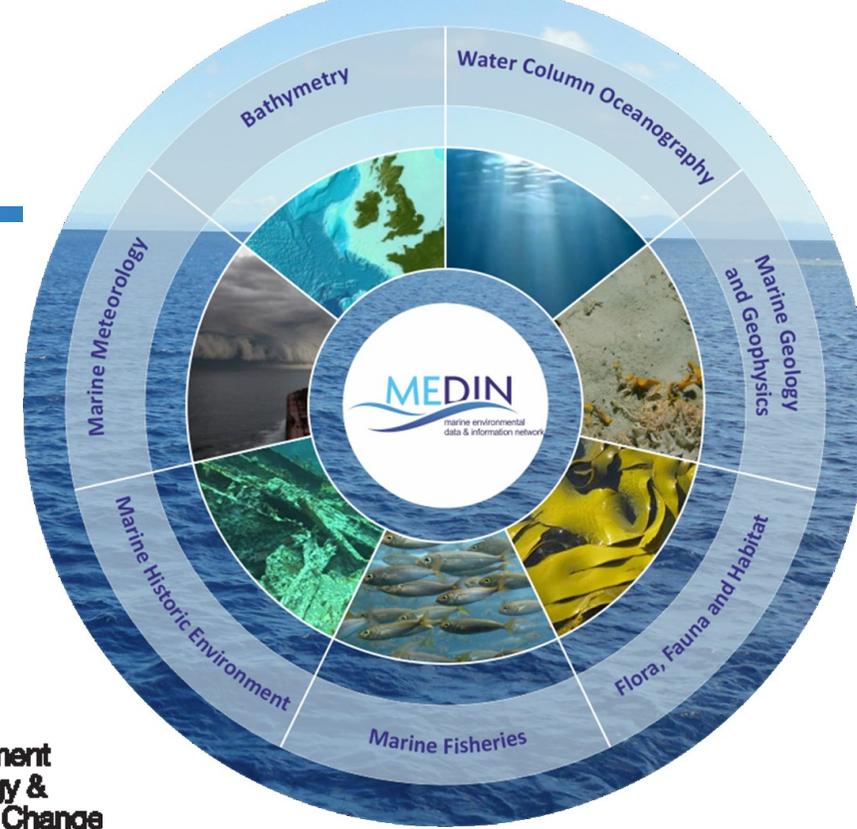
- Developed processes and procedures to assign DOIs to datasets held in our archives
- Joined DataCite as a federation – using one DOI prefix (10.5825) across all the data centres

We are:

- Working with users, funders and journals to encourage data citation and publication, in order to track the impact of data
- Working with other international groups (e.g. CODATA, WDS and the RDA) to develop metrics and standards for data reuse and reproducibility

The screenshot shows the NERC Data Catalogue website. At the top, there is a navigation bar with the NERC logo and links for 'Find data', 'Deposit data', 'Support', 'About', 'Contact us', and 'Help'. Below the navigation bar, there is a 'Spatial' section with a 'Spatial reference system' dropdown set to 'WGS 84' and a 'Datum' dropdown set to 'OSGB 1936 / British National Grid'. There is also a 'Keywords' section with 'Other keywords' (infoMapAccessService), 'Other keywords' (Land cover), 'Place keywords' (Great Britain), and 'Theme keywords' (Land cover). Below this is a 'Dataset identifiers' section with the URL 'https://catalogue.ceh.ac.uk/id/987544e0-22d8-11e4-8c21-0800200c9a66'. The main content area is a 'DataCite Search' interface with a search bar containing 'NERC' and a 'Search' button. Below the search bar, there is a '979 Works' section. The first work is 'Mars Analysis Correction Data Assimilation (MACDA): MGS/TES v1.0' by University Of Oxford And The Open University, published in 2011. The second work is 'Field spectroscopy and leaf trait data from a field experiment in Surrey (HMTF)' by D.A. Coomes, M. Davey & M.H. Nunes, published in 2017. The third work is 'Digital Geological Map Data of Great Britain - 625k (DiGMapUK-625) Bedrock Version 5' by British Geological Survey, published in 2008. On the right side, there are two filters: 'Resource Types' and 'Publication Year'. The 'Resource Types' filter shows counts for Dataset (940), Model (5), Other (3), Text (2), Image (1), and Interactive resource (1). The 'Publication Year' filter shows counts for years from 2017 to 1963, with 2017 having the highest count at 265. At the bottom right, there is a 'Data Centers' filter with 'Natural Environment Research Council' checked and a count of 979.

The Hub for UK Marine Data



Open partnership
Funded by 16 sponsors

Report to Marine Science Coordination Committee

ESSP

Environmental Science to Services Partnership

ESSP Powered by DATA SPRING

Open Data Viewer

1. Locate your area of interest by navigating the map, or searching for a location

2. Use the map layers tool to add data

Map Layers

Land Cover Map 2007

ESSP Powered by DATA SPRING

Open Data Viewer

1. Locate your area of interest by navigating the map, or searching for a location

2. Use the map layers tool to add data

Map Layers

BGS Bedrock geology

ESSP Powered by DATA SPRING

Open Data Viewer

1. Locate your area of interest by navigating the map, or searching for a location

2. Use the map layers tool to add data

Map Layers

Rainfall 5 Day 1971-2000 Long Term Averages

Sunshine Duration

BGS Bedrock geology

Land Cover Map 2007

Click on plus button to add layers to the map.

Legend: Rainfall 5 Day 1971-2000 Long Term Averages

- 0mm to 60mm
- 60mm to 120mm
- 120mm to 180mm
- 180mm to 240mm
- >240mm

Contains OS data © Crown Copyright and database right 2015

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British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

Finance Survey



Introducing DataSpring

ESSP are developing DataSpring, our single sign-on web service providing direct access to multi-disciplinary environmental datasets from the authoritative sources across ESSP.

API management system delivering environmental data, on demand, direct from source:

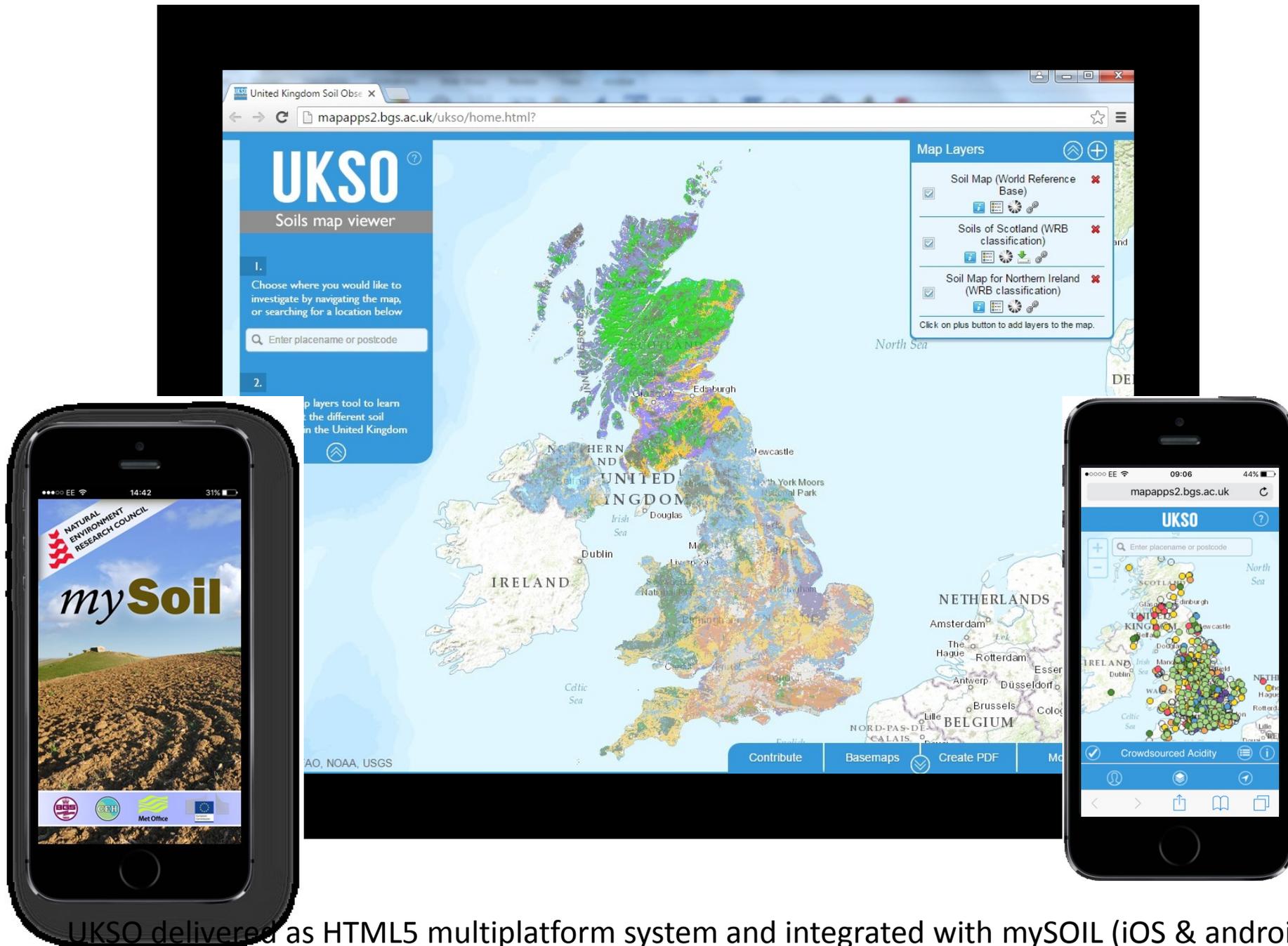
- A discovery interface to find the right data
- Plain-English metadata and documentation to understand each dataset and its technical constraints
- Single sign-on
- Cross-API security token access
- Simplified licenses

Smartphone Applications

The image displays several smartphone screens showcasing BGS mobile applications. The background is a screenshot of the BGS website, featuring the logo and navigation links like 'Home', 'Our data', and 'Apps'. The foreground shows three smartphones:

- Left Smartphone:** Displays a list of 'Barrow Road' entries with grid coordinates and depths. The list includes:
 - Barrow Road ST67SW157 Depth: 8.0m
 - Barrow Road ST67SW163 Depth: 3.6m
 - Barrow Road ST67SW165 Depth: 3.4m
 - Barrow Road ST67SW160 Depth: 8.0m
 - Barrow Road ST67SW159 Depth: 7.0m
 - Barrow Road ST67SW158 Depth: 5.0m
 - Barrow Road ST67SW158 Depth: 5.0m
- Middle Smartphone:** Shows a colorful geological map with various terrain features and labels like 'Beinn Bhearnaich' and 'Beinn Mhàr'. A 'BACK' button is visible at the top.
- Right Smartphone (Top):** Displays a detailed data table for a specific location:

Dominant Habitat	Suburban	Soil Depth	Deep
Organic Matter	No Data	pH	No Data - Add Record
Soil Temp Annual	10.35°C - Average	Soil Temp Monthly	11.62°C - May Average
Soil Parent Material	Colluvium	Soil Texture	Clayey Loam To Sandy Loam
- Right Smartphone (Bottom):** Shows a 3D topographic map of a volcano with a red location marker and a label 'Vesuvius Italy'. The Esri logo is visible at the bottom.



UKSO delivered as HTML5 multiplatform system and integrated with mySOIL (iOS & android)

NERC Vocabulary Server (as a knowledge framework)

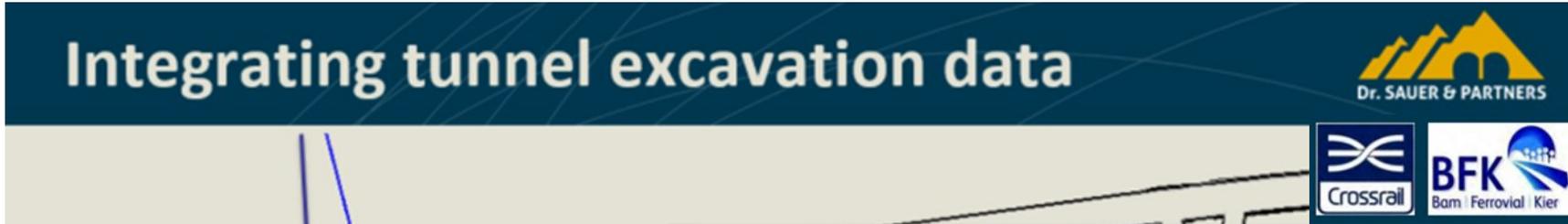
Concepts, Definitions and Relationships

NERC adoption and utilisation,
uptake in science communities
within the UK, Europe and
internationally

The image displays three overlapping browser windows from the NERC Vocabulary Server. The top window shows a collection page for L06. The middle window shows a collection page for L06/31, with the URL <http://vocab.nerc.ac.uk/collection/L06/current/31/> circled in red. The bottom window shows a concept page for 'James Cook', with a 'Same as' relationship URL <http://vocab.nerc.ac.uk/collection/P17/current/740H/> circled in red.

Property	Value
URI	http://vocab.nerc.ac.uk/collection/C17/current/740H/
Identifier ()	SDN:C17::740H
Preferred label (en)	James Cook
Alternative label (en)	JC
Definition (en)	{ "title": "RRS", "country": "United Kingdom", "platformclass": "research vessel", "callsign": "MLRM6", "IMO": "9338242", "commissioned": "2006", "notes": "NERC research vessel replaced RRS Charles Darwin in late 2006." }
Version Info ()	8
Deprecated()	false
Same as	http://www.rvinfobase.eurocean.org/spec/vessel.jsp?id=4140
Same as	http://vocab.nerc.ac.uk/collection/P17/current/740H/
Broader	http://vocab.nerc.ac.uk/collection/L06/current/31/
Broader	http://vocab.nerc.ac.uk/collection/L19/current/SDNKG04/
Date ()	2016-04-13 13:57:41.0

Working with others



Direct access to data and models inside industry software

Autodesk AutoCAD Civil 3D 2015 - Quinley.dwg

TOOLSPACE

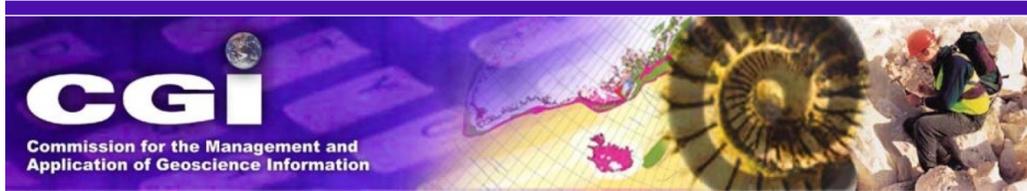
- Quinley
 - Points
 - Point Groups
 - Point Clouds
 - Surfaces
 - BOULDER CLAY - Base
 - BOULDER CLAY - Top
 - FILL - Base
 - FILL - Top
 - Masks
 - Watersheds
 - Definition
 - Boundaries
 - Breaklines
 - Contours
 - DEM Files
 - Drawing Objects
 - Edits
 - Point Files
 - Point Groups
 - Point Survey Queries
 - Figure Survey Queries
 - Alignments
 - Centerline Alignments
 - Alignment - 1
 - Alignment - 2
 - Alignment - 3
 - Alignment - 4
 - Offset Alignments
 - Curb Return Alignments
 - Rail Alignments
 - Miscellaneous Alignments

3D Model View: Shows a network of points (BH134, TP130, BH141, TP191, BH142, TP132, TP169, TP127, BH127, TP122, TP124, BH128, TP140, TP121, TP111, BH129, BH190, BH136) connected by lines, representing a tunnel excavation network. The model includes a topographic surface and a tunnel structure with vertical supports.

Geological Cross-section: Shows a geological profile with layers of Clay [LMB], Sand [LMB], and Gravels. A prominent feature is labeled 'FAULT'. The cross-section is oriented North-South.

Software Interface: The interface includes a ribbon with tabs like Home, Insert, Annotate, Modify, Analyze, View, Manage, Output, Survey, Autodesk 360, Help, Add-ins, BIM 360, Featured Apps, Express Tools, Performance, HoleBASE SI, Geotechnical Module, Geolocation, and Alignments. The TOOLSSPACE panel on the left provides a hierarchical view of the project data. The main viewport shows a 3D wireframe view of the model.

Standards



OGC, ISO, and CGI Application Schemas

Geoscience Markup Language (GeoSciML – CGI & OGC “in press”)

- geological features, geological time, and extends O&M for geological purposes

Earth Resource Markup Language (EarthResourceML – CGI)

- for mineral occurrences, mines, and related activities

Groundwater Markup Language (GWML – OGC)

- extends GeoSciML and O&M to describe hydrogeological features and processes

Full list of OGC application schema standards

<http://www.opengeospatial.org/docs/is>



About ▾ Standards ▾ Innovation ▾ News & Events ▾ Membership ▾ Resources ▾

Sensor Observation Service

- 1) Overview
- 2) Downloads
- 3) Official Schemas
- 4) Related News

1) Overview

The SOS standard is applicable to use cases in which sensor data needs to be managed in an interoperable way. This standard defines a Web service interface which allows querying observations, sensor metadata, as well as representations of observed features. Further, this standard defines means to register new sensors and to remove existing ones. Also, it defines operations to insert new sensor observations. This standard defines this functionality in a binding independent way: two bindings are specified in this document: a KVP binding and a SOAP binding.

2) Downloads

Version	Document Title (click to download)	Document #	Type
2.0	OGC® Sensor Observation Service Interface Standard	12-006	IS
1.0.0	OpenGIS Sensor Observation Service	06-009r6	IS
1.0	OGC® Sensor Observation Service 2.0 Hydrology Profile	14-004r1	BP
1.0	OGC® Best Practice for Sensor Web Enablement Lightweight SOS Profile for Stationary In-Situ Sensors	11-169r1	BP
0.1.4	Sensor Observation Service	05-088r1	D-DP
	OGC Sensor Observation Service 2.0 Hydrology Profile	14-004	D-DP

- OGC® Standards
 - 3dP
 - ARML2.0
 - Cat: ebRIM App Profile: Earth Observation Products
 - Catalogue Service
 - CDB
 - CityGML
 - Coordinate Transformation
 - Filter Encoding
 - GML in JPEG 2000
 - GeoAPI
 - GeoPackage
 - GeoSciML
 - GeoSPARQL
 - Geography Markup Language
 - GeoRSS
 - Geospatial eXtensible Access Control Markup Language (GeoXACML)
 - Geospatial User Feedback (GUF)
 - GroundwaterML
 - I3S
 - IndoorGML
 - InfraGML
 - KML
 - LandInfra
 - Location Services (OpenLS)
 - Moving Features

INSPIRE Thematic Clusters / Earth Science Cluster

Support INSPIRE Implementation

Completely open platform

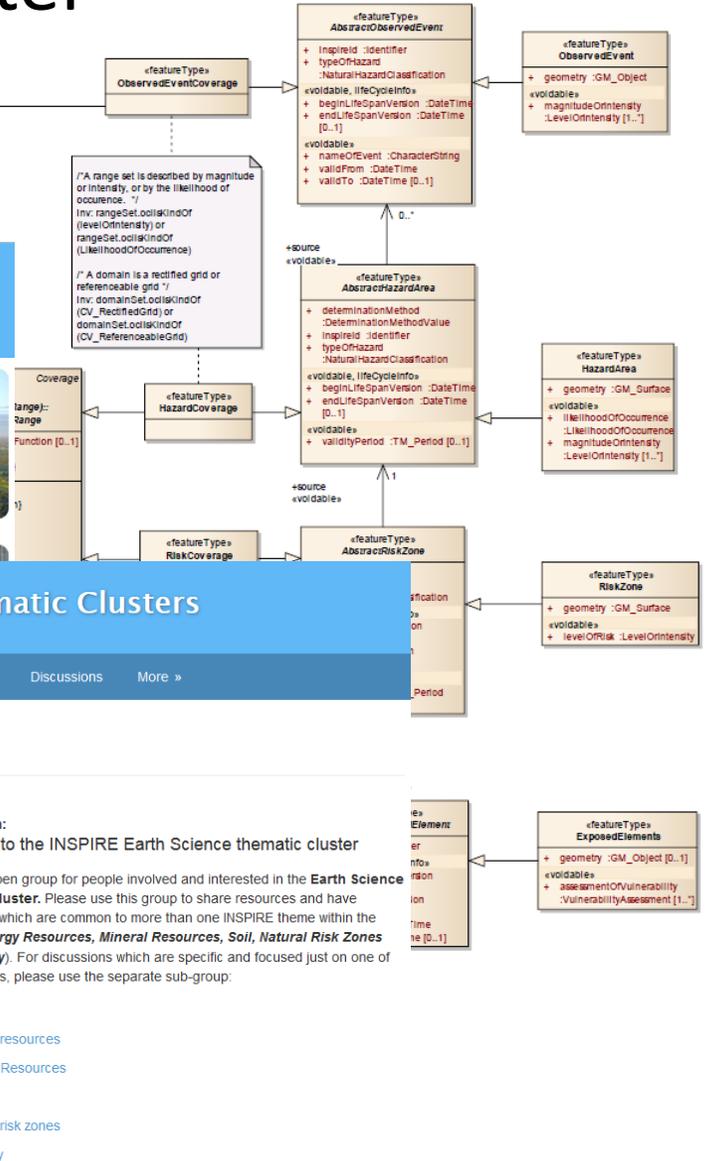
Members of 9 clusters can,

- **Ask and answer questions**
- **Share experiences**
- **Share best practice**
- **Share training resources**
- **& build communities!**

Earth Science Cluster has 169 members,

- Posting questions and replies
- Sharing news items
- Uploading files
- Discussing topics

Please have a look join the platform



NERC Data Labs

Partners from industry, public sectors and universities can collaborate within a trusted environment to develop new research, data and analytical methods that can be made available as commercial or public services as required.



Data-intensive computing

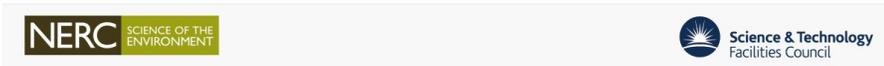
JASMIN provides the UK and European climate and earth-system science communities with an efficient data analysis environment. Many datasets, particularly model data, are too big to be easily shipped around. JASMIN enables scientists to bring their processing to the data.

Flexible data access

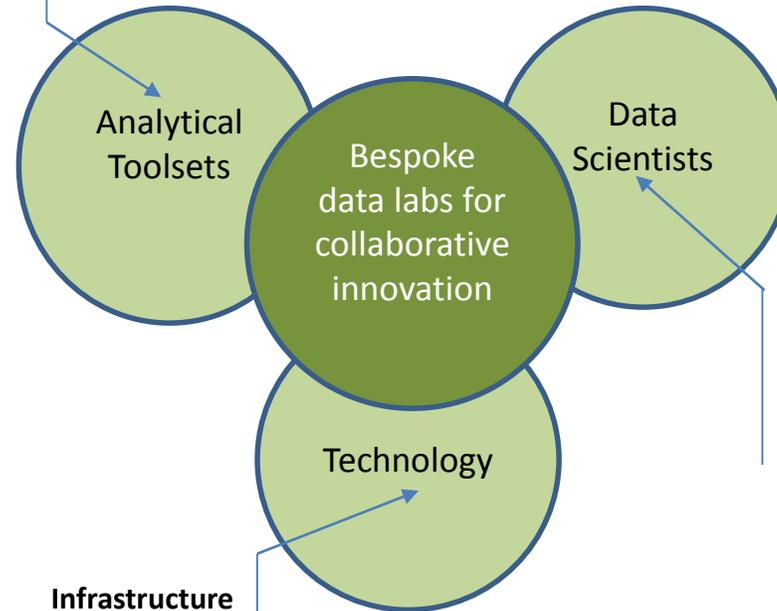
JASMIN provides new ways for scientists to collaborate in self-managing group workspaces, enabling models and algorithms to be evaluated alongside curated archive data, and for data to be shared and evaluated before being deposited in the permanent archive.

Scalable future

JASMIN enables CEDA to carry out its mission of data curation and facilitation more efficiently. Fast, parallel, scalable storage provides a home for in-demand archive data, while a virtualised server infrastructure provides a more capable base for delivery of CEDA's data centre services to the science community.



Consulting
Vision & needs
Methodology
Management



Expertise
Statisticians
Data Specialists
Tools specialists

Infrastructure
Storage
Tools (analysis,
exploration,
Modelling)

DataLabs

Dashboard

Data

Storage

Analysis

Notebooks

Dask

Spark

DataLabs

Help

Change Point Analysis

Further refine the data for analysis, and the analysis types, using the controls below, before pressing the "Analyze" button to produce the output.

- Synchronise X axis?
- Remove timeseries that have NA values, if all data removed, try changing the date range to identify a segment without NA values.

Refine temporal range?

1979-01-01 to 2016-12-31

Techniques to apply

Select the changepoint techniques to apply:

- Mean changepoint (univariate)
- Variance changepoint (univariate)
- Mean + Variance changepoint (univariate)

Select the internal method:

PELT

Select the test statistic:

Normal

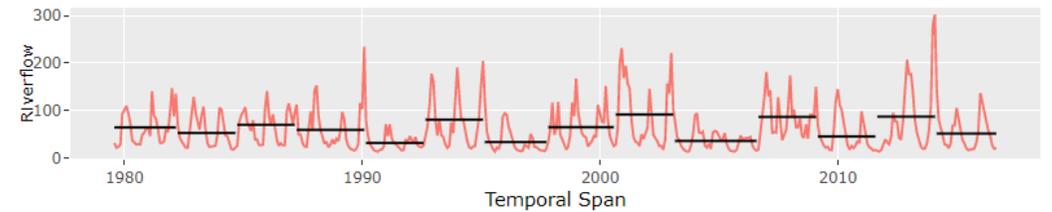
Select penalty:

SIC

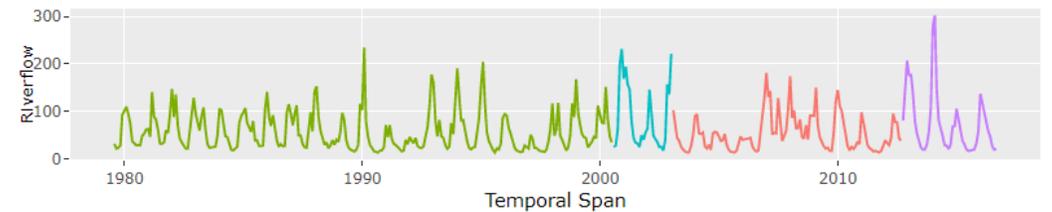
Univariate Change Points

Thames at Royal Windsor Park

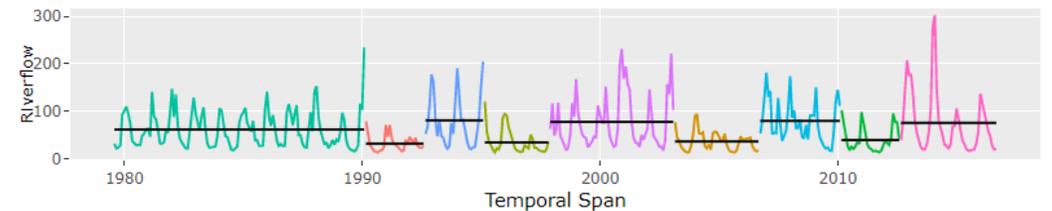
Changepoints at Thames at Royal Windsor Park using cpt.mean

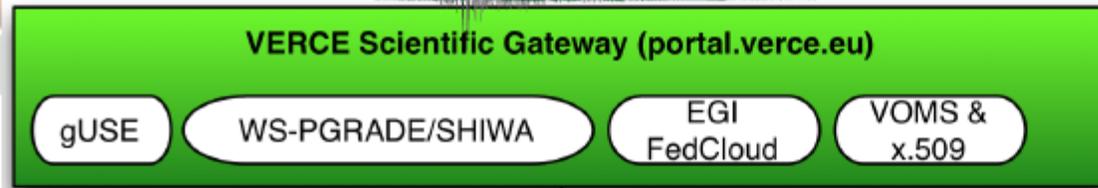


Changepoints at Thames at Royal Windsor Park using cpt.var



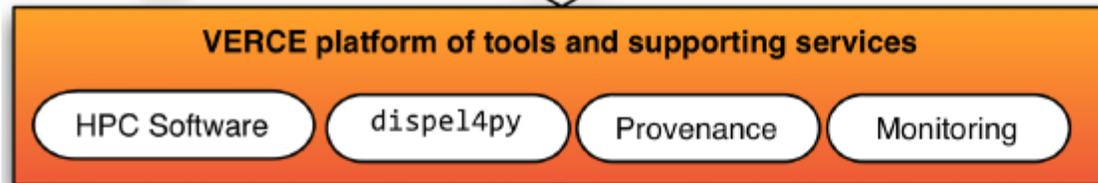
Changepoints at Thames at Royal Windsor Park using cpt.meanvar





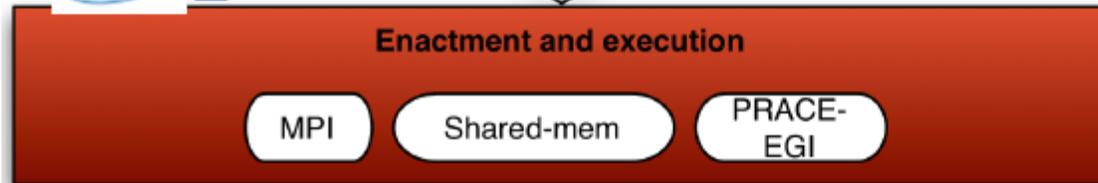
Seismology Domain

- Forward simulation SPECFEM
- Misfit calculation
- Integrated FDSN services

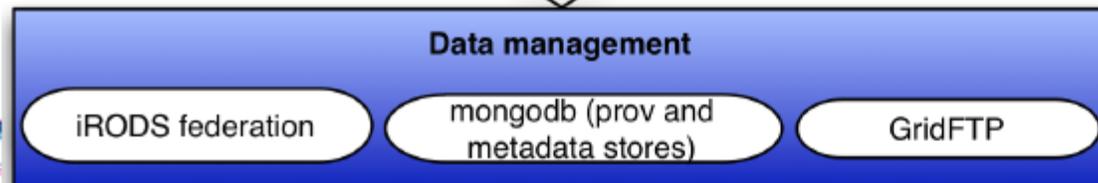


Reusable Components

- Support Gateway functionality
- Support users in a range of tasks
- Workflows and Data-analysis tools



- Execute in multiple contexts with minimal interaction



- Scalable and extensible data-handling capabilities

- Compatibility with EUDAT and future EIDA plans

Thank You

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Dodona Operational Service and Data Innovation Portal requirements

Dr Simon Gardner
Joint Head of Innovation Programmes and Partnerships
NERC



Background

NERC is launching a strategic investment establishing an Environmental Data Service (Dodona EDS), with two primary objectives:

1. To use NERC's data assets and expertise to solve user-defined problems which are often multi- disciplinary, complex and may not map easily onto the expertise of a single data centre/research domain.
2. To realise new data applications and advances in science and innovation by combining NERC data with non-NERC data from other sources or disciplines.



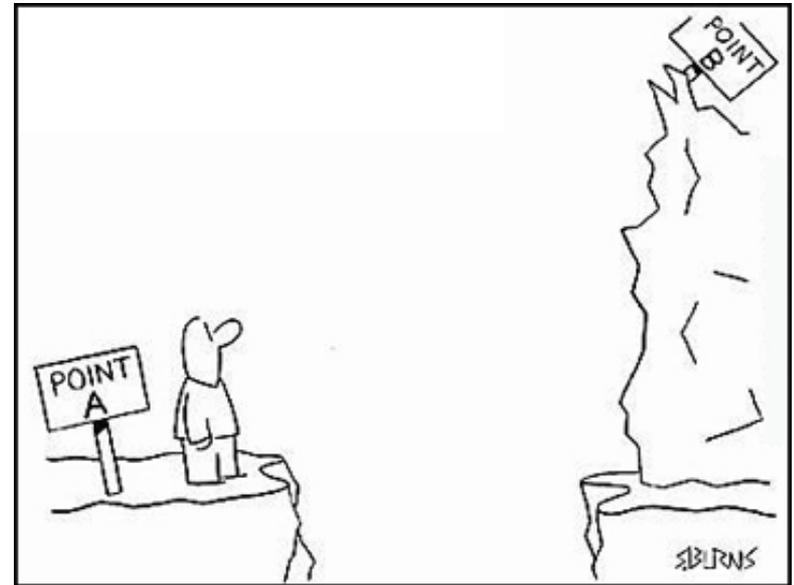
Why are we doing this?

'...It is not enough for public sector bodies simply to publish data, they also have a duty to educate businesses that may be able to exploit the data's full potential by drawing on their intimate and unrivalled expertise, which in many cases has been amassed over years or even decades...'. (Source: Deloitte)



Some of our objectives...

- To refocus on technology 'pull' rather than 'push' (i.e. to be driven by business opportunities, rather than just existing scientific solutions)
- To move beyond data science to data engineering (i.e. designing and creating new services and products that unlock the value in environmental data)
- To enable rapid pull-through of environmental science and data
- To engage with software developers to accelerate innovation
- To provide funding for collaborations that combine business, science and data specialists to co-design and co-deliver new services



What are the building blocks of the Dodona Environmental Data Service?

This will be comprised of three main pillars:

- A **Dodona Operational Service** and **Data Innovation Portal** (the subject of the Prior Information Notice), which will support and co-ordinate the delivery of the Dodona EDS including through a technical platform that will provide a preferred (but not exclusive) point of access into NERC data holdings (£1.95m)
- NERC's **data innovation programmes**, under the management and direction of NERC Head Office (£6.39m)
- Technical **data integration** activities under the management and direction of the NERC Data Centres (£1.84m)



Components of the Dodona Environmental Data Service

Dodona Environmental Data Service

I. Operational Service & II. Data Innovation Portal

- Facilitation and brokerage to support external data consumers
- Reducing barriers to data usage (legal, confidentiality, IPR constraints, etc.)
- Capturing user feedback
- Producing impact reports
- Access to a mosaic of different datasets, tools and services for external users

Procurement process

III. Data Innovation Programmes

- Coordination of data innovation calls

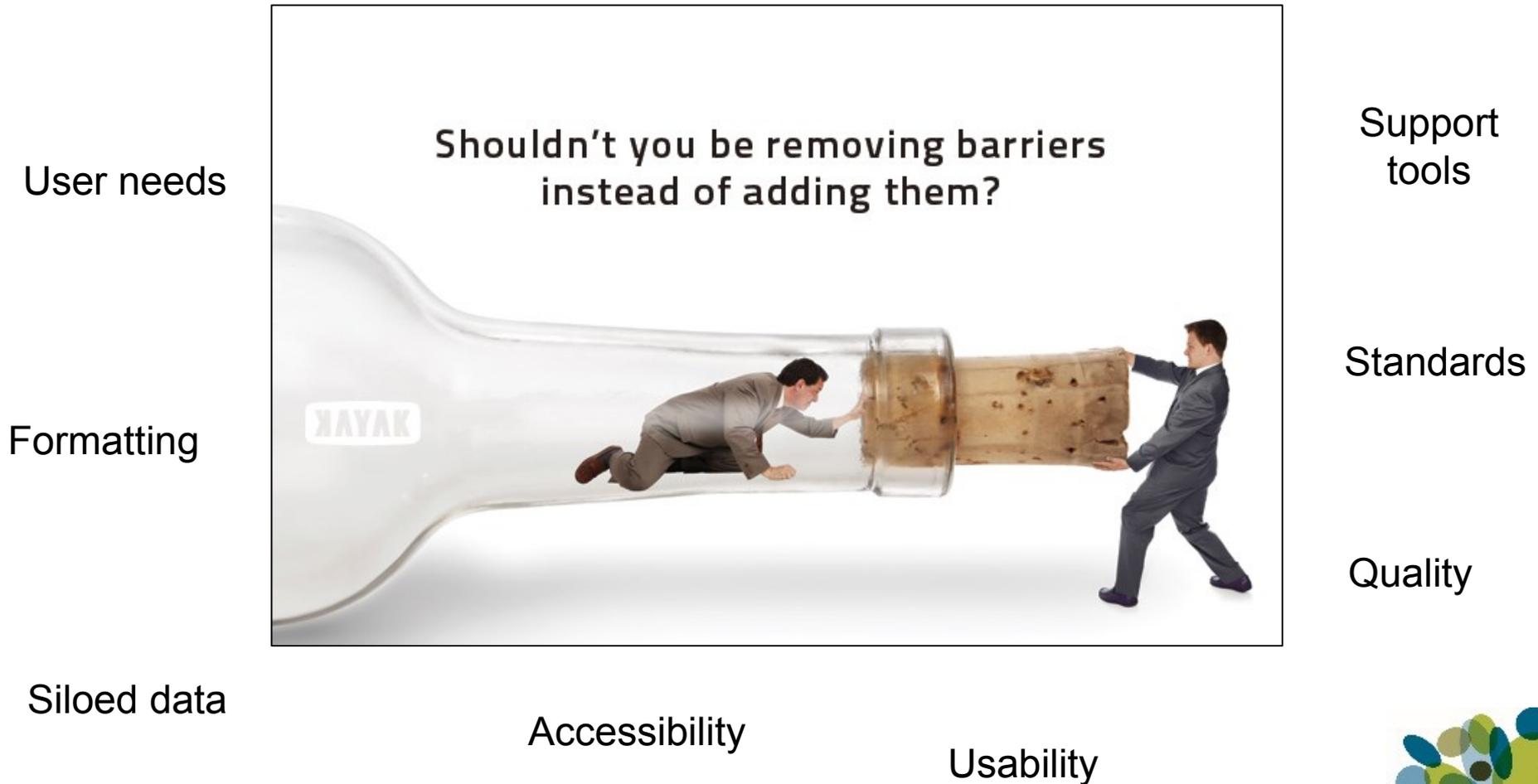
IV. Data Integration Activities

- Development of common processes and procedures
- Improved data interoperability
- Analytical and technical tools
- Integration of NERC data with that from other data holders, users or sources to produce new and commercially valuable hybrid data products

National Commissioning process



Reducing data barriers



I. Dodona Operational Service: key elements

- Building and brokering relationships with the UK data community and facilitating relationships between data providers and end-users to generate impactful innovation activity
- Routine management and updating of the content associated with the user-facing aspects of the portal
- Working with NERC Head Office Innovation staff to support the development of high quality and innovative proposals for the managed funding calls
- To support the further development of NERC approaches to data availability and discoverability.



I. Dodona Operational Service

- Working **externally** with data-producers and data-users to create the right conditions for data innovation through:
 - Understanding the needs of (current and potential) data customers
 - Improving data discoverability
 - Reducing barriers to data access
 - Reducing barriers to data use

Brokerage and Facilitation



I. Dodona Operational Service

- Working **internally** with:
 - NERC Head Office Innovation staff on supporting calls and assisting in the running of brokerage events.
 - The Head of Data Integration and the Data Centres to ensure the right data is available, in the right format, from the right sources (internal, external, single-discipline, multi-discipline)

Brokerage and Facilitation



II. Data innovation portal: objectives

- **To deliver** a step-change in the way that environmental data are made available, integrated with cross-disciplinary data, analysed and used to deliver impact

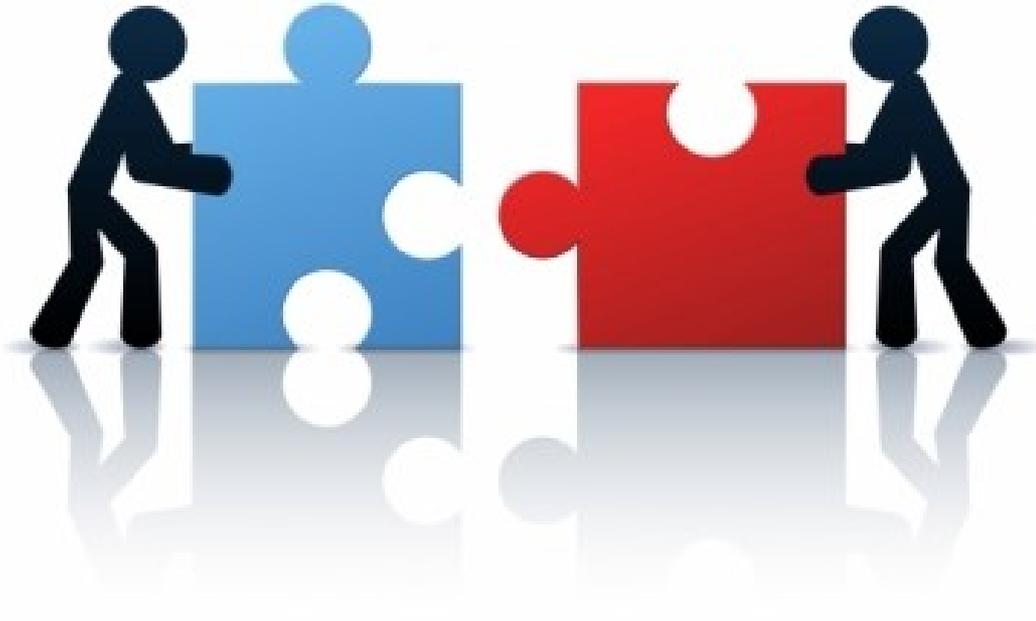


II. Data innovation portal: objectives

- **To provide** access to world-leading capability in data analytics skills and tools for the environmental sciences, with a key focus on data interoperability and cross-disciplinary working



II. Data innovation portal: objectives



- **To enable** the Dodona Operational Service to actively broker links between users, relevant datasets and analytical tools, in order to generate projects that will deliver economic and societal benefit.



II. The Data Innovation Portal

- In the first instance, the Dodona-EDS will be primarily built around existing NERC data centre investments.
- As part of a phased development, the ambition is to also encompass environmental datasets from other organisations, and ultimately cross-disciplinary datasets.



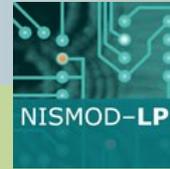
Internal



External

Proposed direction of travel for NERC data Innovation activities

NERC Data Centres



'Environment space'

Improved data integration across UKRI

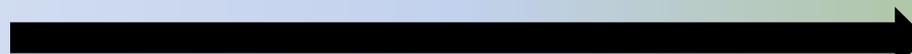
Working with other data hubs

Single organisation



Multi-organisational

Single discipline



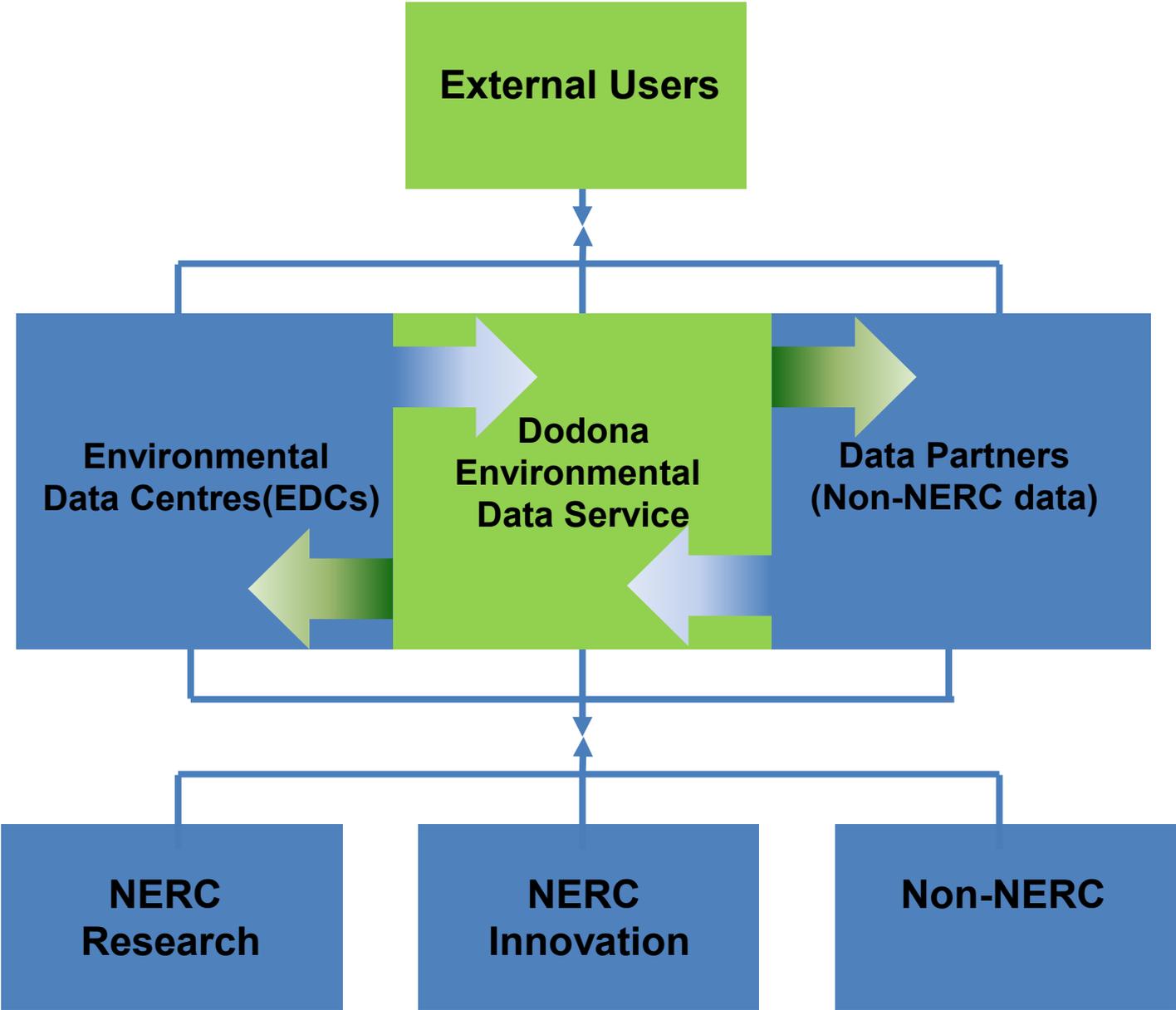
Multi-disciplinary

II. The Data Innovation Portal

- A mosaic of data, expertise, and data analysis tools will be made available to expert and non-expert users in an accessible way through the Dodona portal.
- The aim is to go beyond self-service for data users, and to create a constant cycle of positive interaction with the data as new products are created



Interdependencies between the Dodona Environmental Data Service and other communities



II. The data innovation portal - expectations

- An eye-catching flagship environmental data and innovation hub, which provides users with a single point of access into the 10-15 Petabytes of environmental data which exist across NERC, its data services, and its expertise
- Should not aim to replicate existing data and services, but to make them available in a more consistent, accessible and integrated manner
- Will employ a number of metrics (for example, site visits, data downloads, user feedback, data usage reports for third party data providers) in order to build up an evidence base for impact narratives
- The portal will be developed in an incremental way. There is not an expectation that it will 'deliver everything, in all ways' (some NERC datasets are held in idiosyncratic formats, are temporally-spatially limited and have a small potential customer base)



Dodona Environmental Data Service

A step change in data innovation

Tools and Services

- Development of common processes and procedures
- Analytical and technical tools
- Data Centre Expertise

Operational Service

- Facilitation and brokerage to support external data consumers
- Capturing user feedback
- Producing impact reports
- Coordination of call for Ideas process

£10m
investment

Challenge-led
innovation

Technical Integration

- Data availability
- Data inter-operability
- Data usage
- Integration of NERC data with that from other data holders, users or sources to produce new and commercially valuable hybrid data products

Data Innovation Portal

- Data discoverability
- User registration data
- User feedback

Business
focused

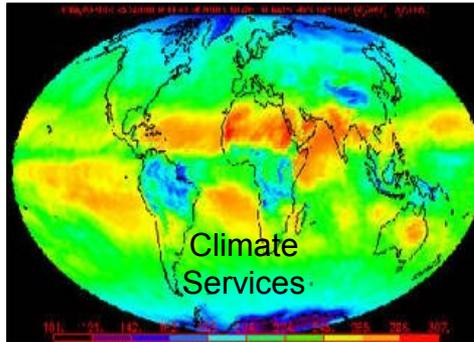


III. Data innovation calls

- To work with the EDS Executive Board and NERC Innovation staff to coordinate a process to capture user challenges, issues and needs with respect to environmental data.
- To collaborate with the EDS Executive Board and NERC Innovation staff to constitute Thematic Challenge groups, constituted with Board members and a series of Sector Associates (end-users), to define challenges and mechanisms.
- To engage with identified Sector Associates, and to assess the most appropriate 'pathway' for the chosen innovation theme (for example, air quality in urban systems) to achieve impact (up to 2 Thematic Challenge areas can run at any one time)
- To provide evidence and support for innovation investment decisions which will be used to fund further development of national infrastructure, training, data collection or data inter-operability
- To support brokerage, networking and delivery of activities in each Thematic Challenge area.



Future challenge areas for data innovation could include:



UK Shared Business Services (UK SBS) Procurement

Ben Osborne
Category Manager, Common Goods and Services



About UK SBS Procurement

- The UK SBS Strategic Procurement function delivers an end-to-end integrated procurement service on behalf of the seven Research Councils, BEIS and some of its ALBs
- Our core service lines are sourcing and category management with operational and functional support that covers policy, eCommerce and other enabling activities, as well as commercial intelligence
- We have procurement teams based in our Swindon and Newport offices, with staff also deployed at dedicated customer sites such as STFC RAL and Daresbury Laboratory
- For FY 16/17, the function managed £850M procurement spend and achieved savings over £51M

The logo for UKSBS Shared Business Services is located in the bottom right corner. It features the text 'UKSBS' in a bold, blue, sans-serif font. Below this, there is a stylized wave graphic in shades of blue and red. Underneath the wave, the text 'Shared Business Services' is written in a smaller, blue, sans-serif font. The entire logo is set against a dark blue background.

UKSBS

Shared Business Services

Who UK SBS Procurement provide services to

