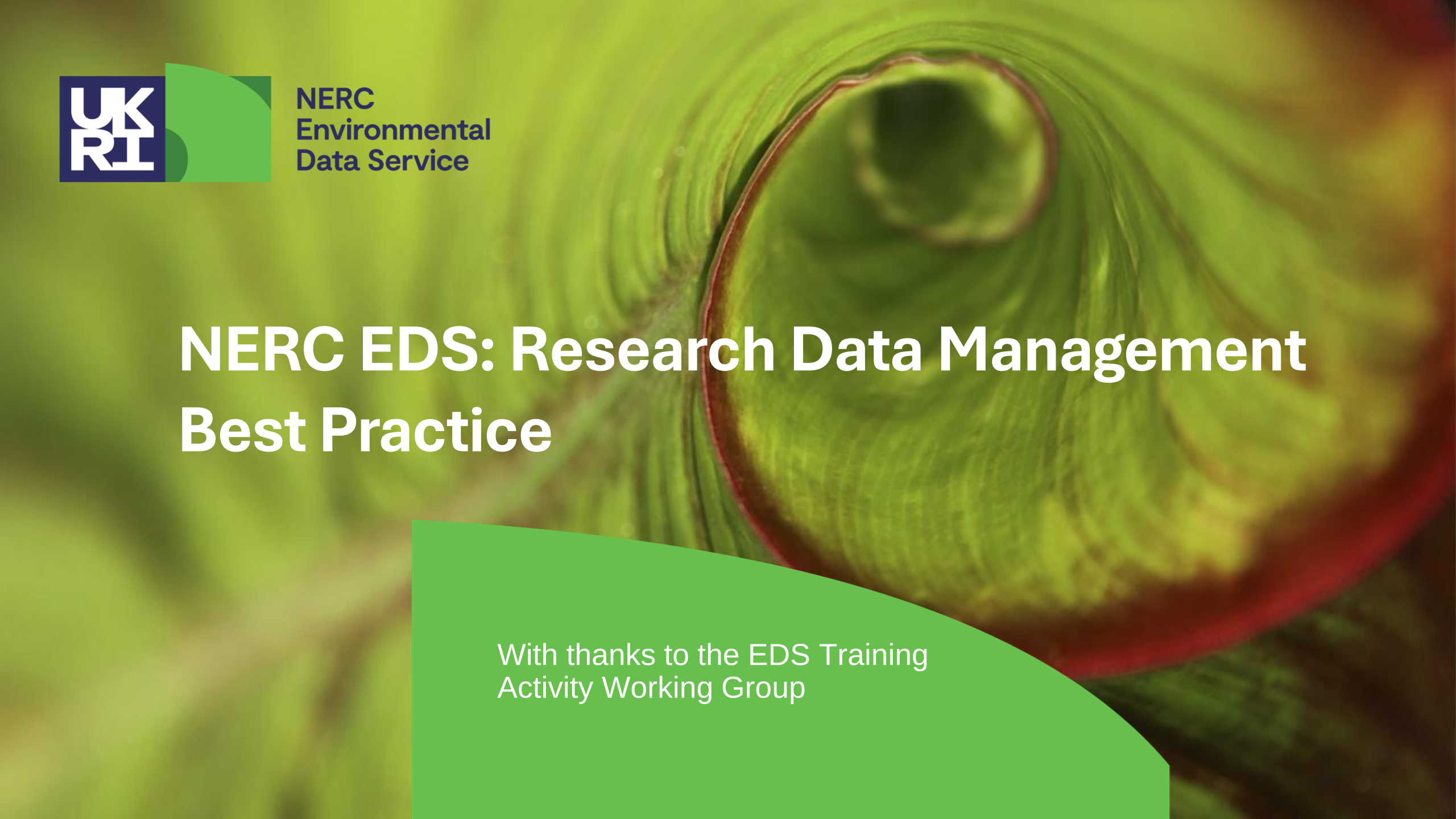

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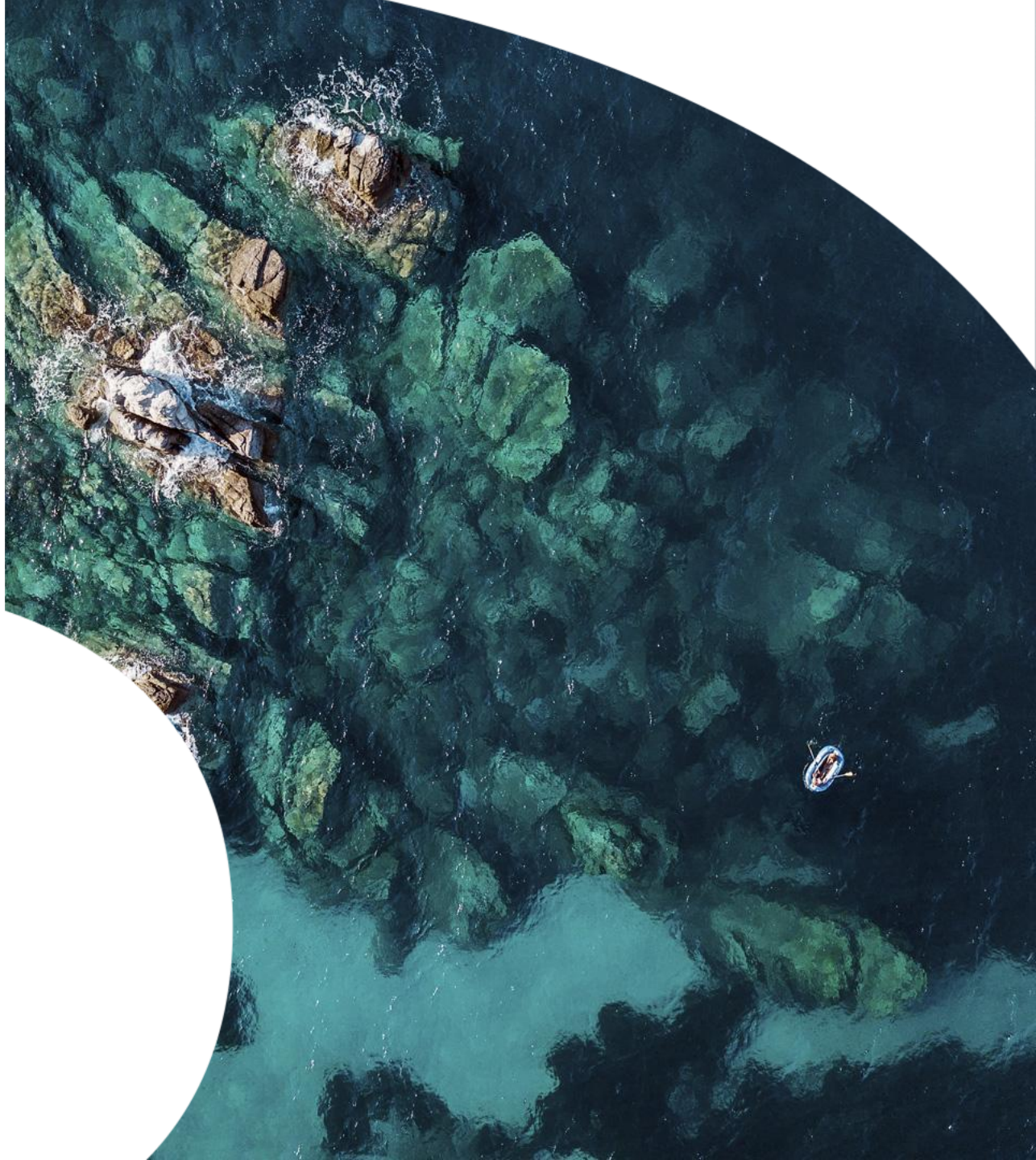
NERC EDS: Research Data Management Best Practice

With thanks to the EDS Training Activity Working Group

Content

- Data Life Cycle
- Data Collection and Management



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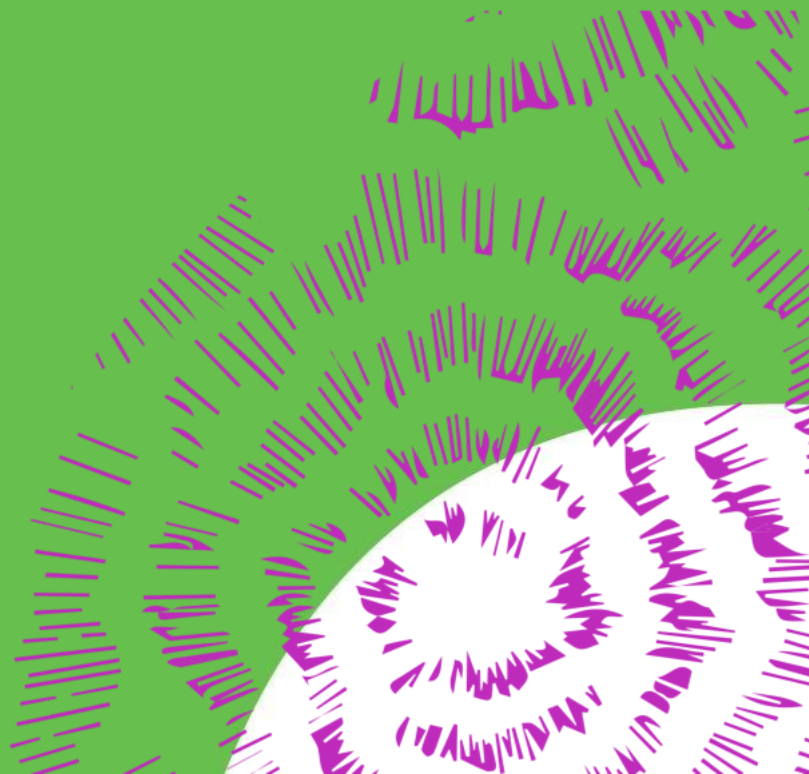
The Data Life Cycle

In this section, you will learn how to organise your data through planning, collection, analysis, publication and beyond



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RDM lifecycle

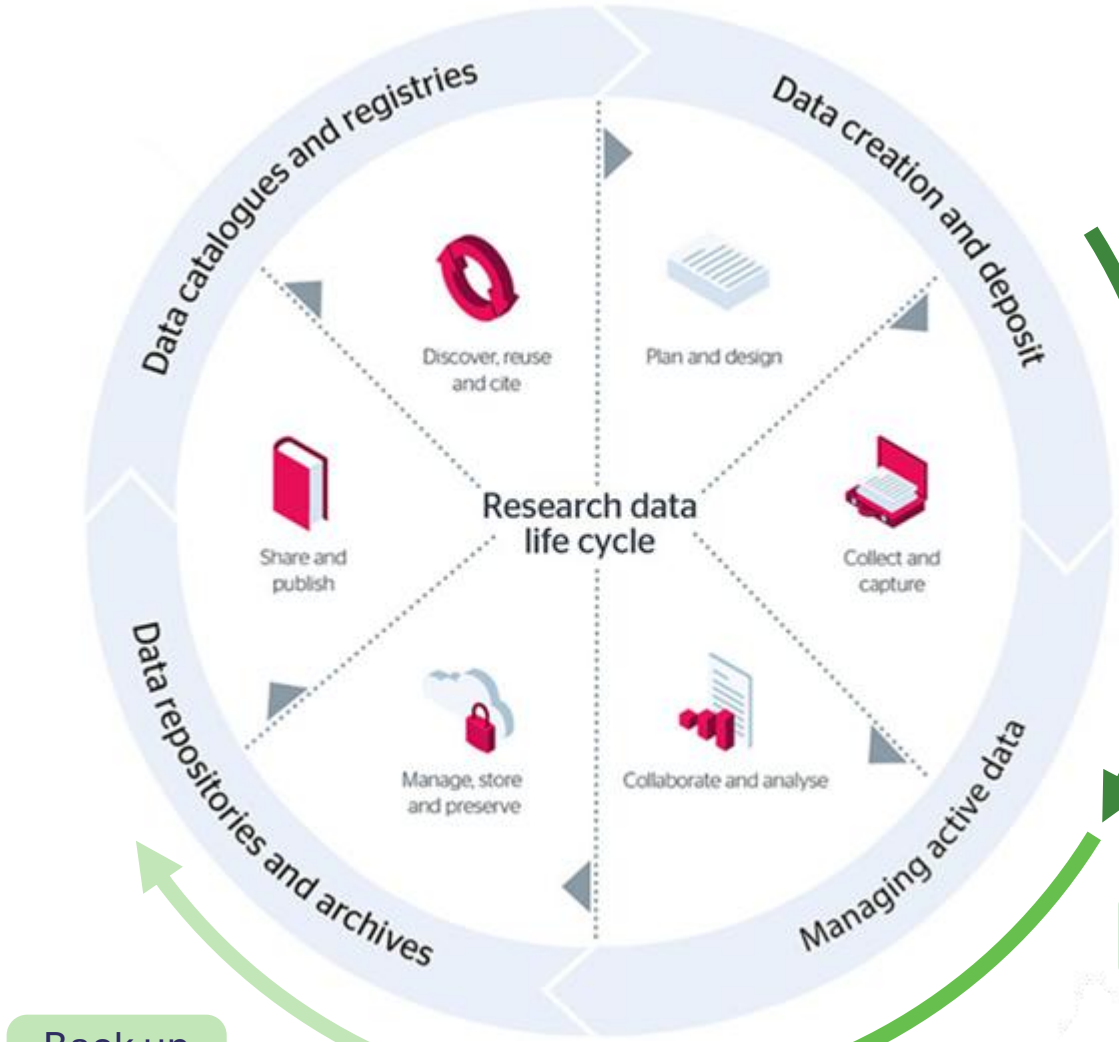
- Data Collection
- Processing and management day-to-day

Describe the data

Process the data

Organise the data

Save the data



Collection

Naming convention

Metadata

Versioning

Data formats

Back up storage

© Jisc

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Collecting data in the field

Understand the deployment environment by asking yourself the following questions:

- Is it a deep field site or a remote field station?
- Data server – may have RAID storage, offline backups
- Time server – run an NTP client to sync accurate time
- Reliable power supply – consider UPS, surge protection, IP PDU
- Remote network comms: scheduled transmission and remote login

General tips:

- Storage is cheap, but collecting remote, in situ data, is expensive
- Structure raw data appropriately
- Monitor and alarm propagation
- Have a second storage device
- Ensure available storage can withstand a missed site visit
- Capture metadata along data acquisition

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Case study: Data collection on a ship

Ship track – position data

'Event' deployments – needs to be linked to other continuous data

Physical sample/lab metadata

Multiple continuous data acquisition systems e.g. Multibeam echosounder, ADCP

I prepare the information and material I need for my analysis, record any information that might impact the quality of the data, make sure to back up the data

Data on a day-to-day basis

DOCUMENTATION AT PROJECT LEVEL

- Data collection methods, including instruments and protocols
- Standards used and replication
- File and data structure
- Procedures for quality control and versioning
- Problems that may affect the use of the data

DOCUMENTATION AT DATA LEVEL

- Date created and version
- Names and definitions of fields (variables)
- Reasons for missing values
- Problems that may affect specific records
- Code used to generate processed data values

Recording these details will make it easier to create metadata

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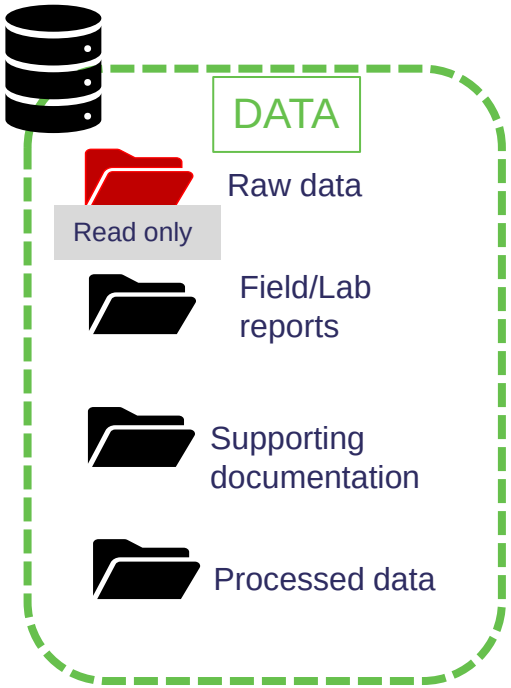
After Sandy Harrison presentation on RDM

Manage your citations and references using citation software

Folder structures



Use folders and structure them hierarchically

- Group files within folders so particular topics are in one place
- Make sure folder structure is understandable by others
- Start with a limited number of generic folders, then create more specific sub-folders

Adhere to existing procedures

- Check for established team/department approaches which you can adopt
- Agree on a common folder structure that makes sense to everyone
- Document strategy in DMP

Name folders and file appropriately

- Be consistent when you name your data and the folders they're stored in
- Avoid spaces and special characters
- Use a file naming convention

Separate raw and working data

- Do not make any changes / corrections to the original raw data files to preserve original files
- Consider having your raw data read only to avoid deletion or changes.

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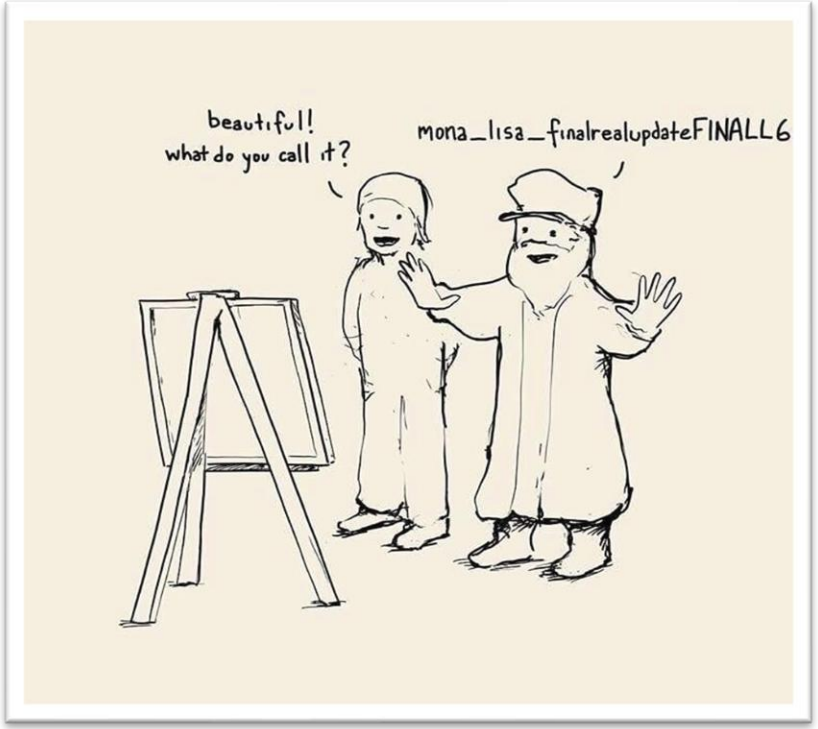
File-naming conventions

Decide on a file naming convention at the start of your project. Useful file names are:

- ✓ Consistent
- ✓ Meaningful to you and your colleagues
- ✓ Allow you to find the file easily



Some tips:

- ✓Start your file name with the date, formatted as YYYYMMDD, to display your files in chronological order
- ✓Don't make file names too long
- ✓Special characters should be avoided
- ✓ For sequential numbering, use leading zeros to ensure files sort properly."01, 02…99, etc" instead of "1, 2…99, etc."
- ✓Do not use spaces: Instead use underscore (file_name), dashes (file--name), no separation (filename or FileName)
- ✓Include versioning when appropriate

File name	Changes to file
ResearchReport_1.0	Original document
ResearchReport_1.1	Minor revision made
ResearchReport_1.2	Further minor revisions
ResearchReport_2.0	Second approved version

https://help.eds.ukri.org/article/5182-file-naming

Units

- Describing parameters in a reusable way
- Making data understandable for others
- Placed in the header, not in the data
- Unified Code for Units of Measurement (UCUM)
  - All units of measure
  - International science, engineering
  - 7-bit US-ASCII character set

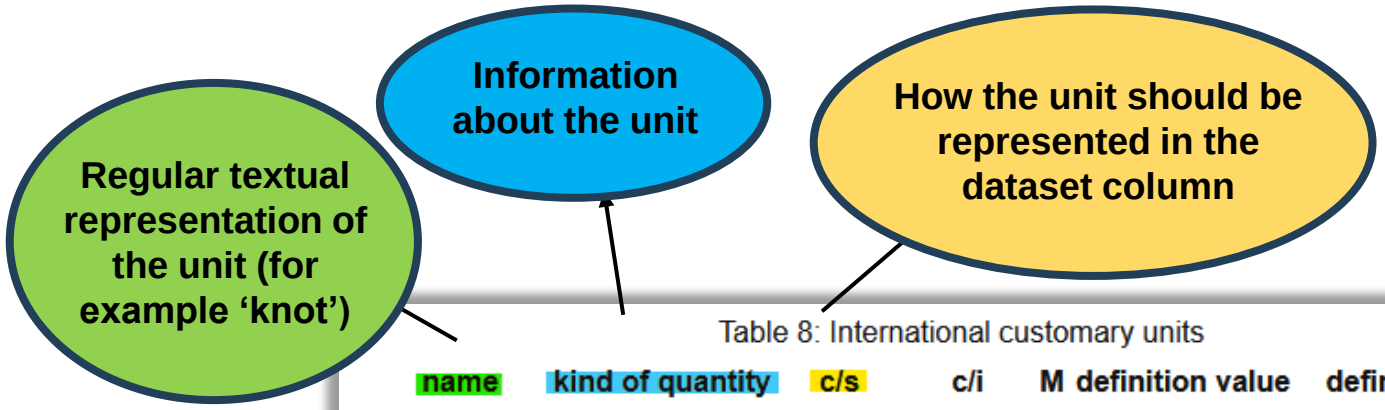


Table 8: International customary units

name	kind of quantity	c/s	c/i	M	definition value	definition unit
inch	length	[in_i]	[IN_I]	no	2.54	cm
foot	length	[ft_i]	[FT_I]	no	12	[in_i]
yard	length	[yd_i]	[YD_I]	no	3	[ft_i]
mile	length	[mi_i]	[MI_I]	no	5280	[ft_i]
fathom	depth of water	[fth_i]	[FTH_I]	no	6	[ft_i]
nautical mile	length	[nmi_i]	[NMI_I]	no	1852	m
knot	velocity	[kn_i]	[KN_I]	no	1	[nmi_i]/h
square inch	area	[sin_i]	[SIN_I]	no	1	[in_i]2
square foot	area	[sft_i]	[SFT_I]	no	1	[ft_i]2
square yard	area	[syd_i]	[SYD_I]	no	1	[yd_i]2
cubic inch	volume	[cin_i]	[CIN_I]	no	1	[in_i]3
cubic foot	volume	[cft_i]	[CFT_I]	no	1	[ft_i]3
cubic yard	volume	[cyd_i]	[CYD_I]	no	1	[yd_i]3
board foot	volume	[bf_i]	[BF_I]	no	144	[in_i]3
cord	volume	[cr_i]	[CR_I]	no	128	[ft_i]3
mil	length	[mil_i]	[MIL_I]	no	1×10^{-3}	[in_i]
circular mil	area	[cml_i]	[CML_I]	no	1	[pi]/4.[mil_i]2
hand	height of horses	[hd_i]	[HD_I]	no	4	[in_i]

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