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Introduction to Managing Research Data

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Introduction to Managing Research Data

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Workshop agenda

1. What is research data?
2. Why do you need to manage data?
3. Creating data management plans
4. Best practices for data curation
5. Choosing a data repository

1. What is research data?

- How is research data defined?
- What does it look like?

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Definition of research data

“Any information that has been collected, observed, generated, or created to validate original research findings.”

It’s the tangible output from your research, and it is very valuable - if you lose it, you may have to do the research again. Take good care of it!

Research data (depending on type of research) can consist of:

- **Digital files** (computer code, models, Word documents, spreadsheets, databases)
- **Multimedia files** (audio, video, photographs, images, shapefiles of spatial data or 3D parts)
- **Transcripts, interview notes, survey results**
- (sometimes) **Physical specimens**, artifacts, sensor readings

2. Why manage research data?

1. Important for success of your research project
2. May be required by your research project funder!

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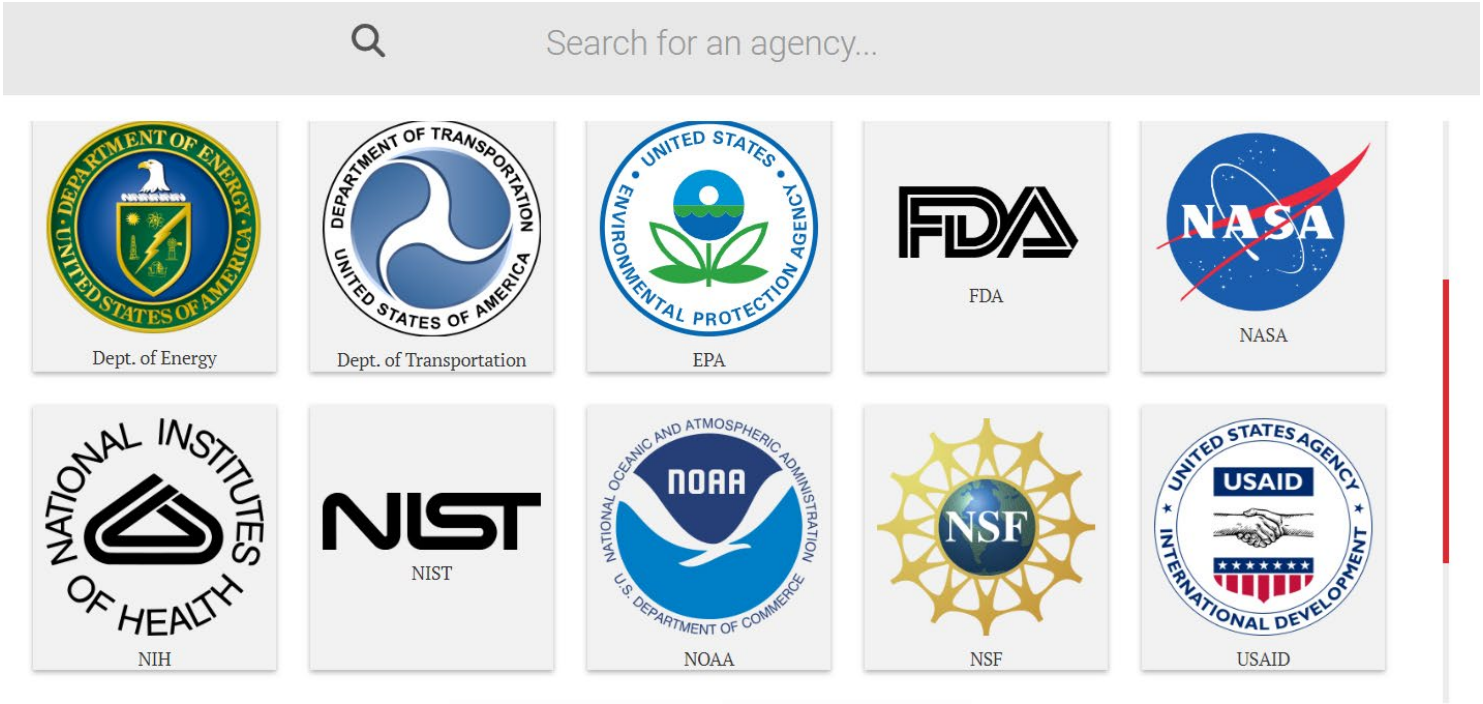
Importance of Data Management to you

- **Reproducibility** critical to getting credit for research findings - not everyone will “take your word for it” that you discovered something - you need **data to back up findings**
- Without good plan for managing your data, **data may be lost**, making it impossible to reproduce results
- FAIR principles: Findability, Accessibility, Interoperability, & Reusability

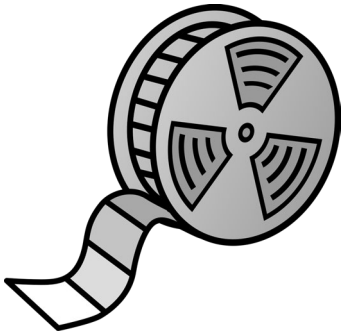
Funder data sharing requirements

- Rowan research often funded by U.S. federal agencies (NSF, NIH, DOD, DOE etc)
- U.S. federal government increasingly requires proposals for funding to include **Data Management Plans** - plans for publicly sharing research data by 1 year after publication of results (or sooner)
- Find out what sharing plans your funder requires
- Will likely need to create Data Management Plan

Policy search: datasharing.sparcopen.org/data/



3. Creating Data Management Plans



Let's watch this 2 minute video introducing Data Management Plans:

https://player.vimeo.com/video/82408192?h=1777264b05

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Data Management Plan purpose and goals

1. Assures that data management is not **forgotten or postponed** (always a temptation)
2. Provides research team specific **written guidelines** for managing data during project
3. Helps everyone on team handle data **consistently**
4. Provides **documentation** for new research team members
5. *Describes plans for **public data sharing** after project ends

Elements of a Data Management Plan

- Principal Investigator responsible for creating the DMP
- A Data Management Plan must address these basic elements:
  - Project, experiment, and data descriptions
  - Documentation, organization, and storage of data
  - Access, sharing, and reuse of data
  - Archiving of data
- For help visit our Library guide on Data Management Plans

About the DMPTool

- Librarians collaborated with Division of Research to provide a **customized Rowan version** of the DMP Tool
- Go to “dmptool.org” in your browser, enter your Rowan email
- Select blue button “Sign in with Institution SSO”, log in
- Home page (next slide) shows your existing plans if any
- Options to **Review Funder Requirements**, look at **Public Plans** to see examples, or **Create a** (Data Management) **Plan**

DMP Tool

Quick Start Guide

DMP Tool

Rowan University (rowan.edu)

- Division of University Research
- Research Data Management LibGuide
- Information Resources & Technology Services
- Contact Rowan University's Administrator

Successfully signed in

My Dashboard

The table below lists the plans that you have created, and that have been shared with you by others. You can edit, share, download, make a copy, or remove these plans at any time.

Project Title	Template	Edited	Role	Test	Visibility	Shared	
How soils behave when loads are applied	NSF-ENG: Engineering	05-02-2016	Owner	☐	Private	No	Actions

Create plan

DMP Tool options

- Create a new plan
- **Edit an existing plan (click on plan title)**
- View public plans created by others
- Use template supplied by your funder
- Download a copy to your computer
- Share plan with collaborators
- Register finished plan and add it to your ORCID account
    - Learn more about ORCID at Rowan

First: identify funder requirements

Funder Requirements

Templates for data management plans are based on the specific requirements listed in funder policy documents. The DMP Tool maintains these templates, however, researchers should always consult the program officers and policy documents directly for authoritative guidance. Sample plans are provided by a funder or another trusted party.

Search

Template Name	Download	Organization name	Last Updated	Funder Links	Create a new plan	Sample Plans (if available)
Agency for Healthcare Research and Quality (ARHQ)		Agency for Healthcare Research and Quality (ahrq.gov)	06-27-2024	ARHQ DMP Notice Number: NOT-HS-20-011		
Alfred P. Sloan Foundation		Alfred P. Sloan Foundation (sloan.org)	06-27-2024	Sloan Grant Proposal Guidelines		
Arctic Data Center: NSF Polar Programs		National Science Foundation (nsf.gov)	06-27-2024	NSF Arctic Data Center DMP Resources NSF Proposal & Award Policies & Procedures Guide (PAPPG) NSF Grants.gov Application Guide (NSF 24-006)		
BCO-DMO NSF OCE: Biological and Chemical Oceanography		National Science Foundation (nsf.gov)	06-27-2024	NSF OCE Sample and Data Policy NSF GEO DIrectorate Guidance NSF Proposal & Award Policies & Procedures Guide (PAPPG) (NSF 24-1) NSF Grants.gov Application Guide (NSF 24-006)		

Next: create a new plan

Create a new plan

Before you get started, we need some information about your research project to set you up with the best DMP template for your needs.

* What research project are you planning?

Teaching Rowan faculty and Graduate Students how to Create Data Management Plans

☑ mock project for testing, practice, or educational purposes

* Select the primary research organization

Research organization

Rowan University (rowan.edu)

- or -

☐ No research organization associated with this plan or my research organization is not listed

* Select the primary funding organization

Funder

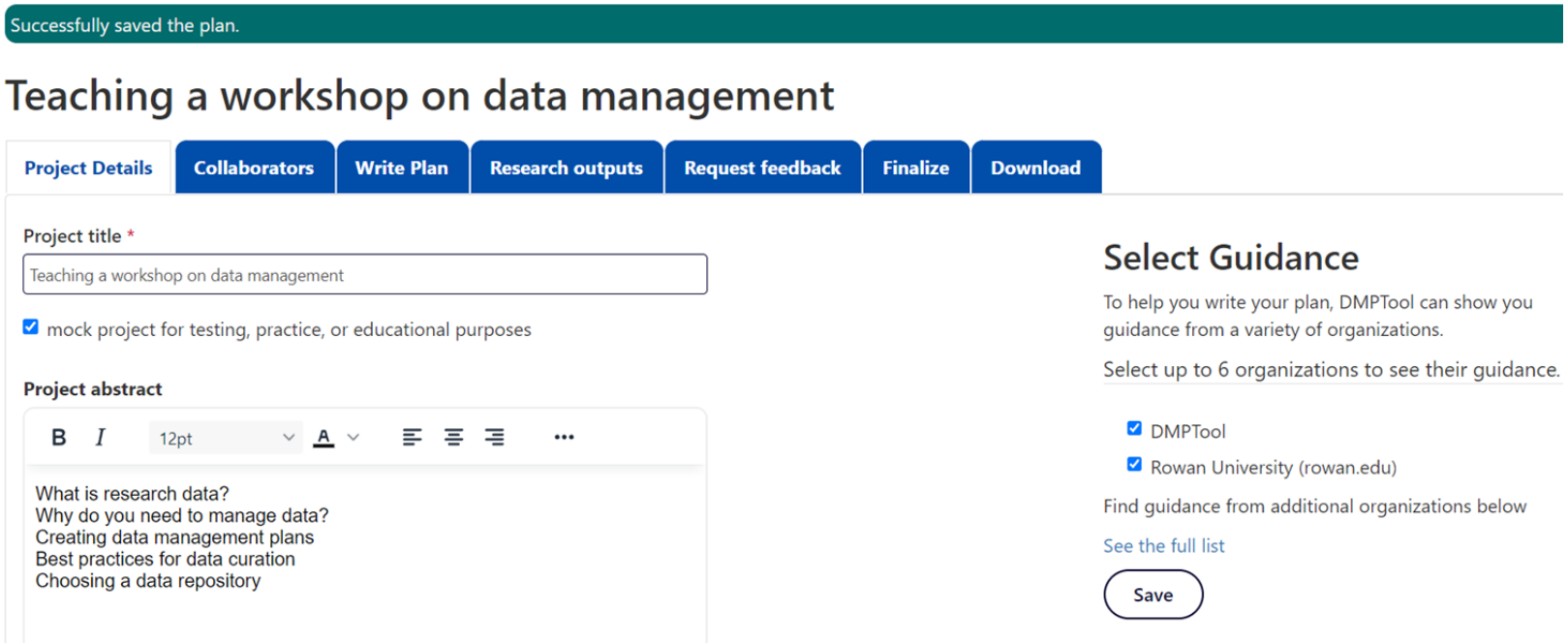
Institute of Museum and Library Services (imls.gov)

- or -

☐ No funder associated with this plan or my funder is not listed

Create plan | Cancel

Then: continue filling out plan, following steps on blue tabs across top



4. Best practices for data curation

How to take care of your data for long term preservation

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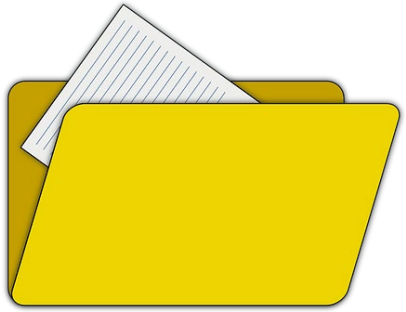
Data curation considerations



- **File format** - plan for software obsolescence; try to keep copies of files in non-proprietary formats
- **File naming** - create naming conventions for data files that ensure names are unique, consistent, & informative
- **Documenting your data** - use metadata standards and data dictionaries to describe large datasets consistently
- **Data storage/archiving** - use university servers or cloud storage services, not physical media; use encryption if needed for security but avoid otherwise

Create a unique identifier for your data

- After project completion, organize your research data into a stand-alone dataset that is well-described and documented
- Journals may require you to **create a DOI** (Digital Object Identifier) for datasets accompanying journal publication

- DOI can be created independently of a journal using CrossRef (https://www.crossref.org/documentation/register-maintain-records/creating-and-managing-dois/)
- Learn how here: https://academia.stackexchange.com/questions/52032/how-do-i-get-a-doi-for-a-dataset

5. Choosing a data repository

- Funding agencies typically require that research data be stored in data repositories accessible to the public
- Must identify one up front when doing DMP
- Fortunately there are lots of choices

PubMed®

zenodo

figshare

ED.gov IES Institute of Education Sciences

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Data Repositories

- Google now offers a Datasets Search
- Use DataCite Commons to search by keyword
- Multi-disciplinary repositories (open/commercial): Zenodo, Figshare, Dryad, DataVerse, OSF, ArXiv
- For medicine, PubMed Central is usually required
- Education/SS - ERIC, Humanities Commons, SocarXiv
- Huge # of specialized repositories for scientific fields, for example: Hydroshare (hydrology), ESS-DIVE (earth sci)

Thank you for attending my workshop!

Questions?

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