

Data Management Planning

Amber Budden



0000-0003-2885-3980

NSF Award #1546024



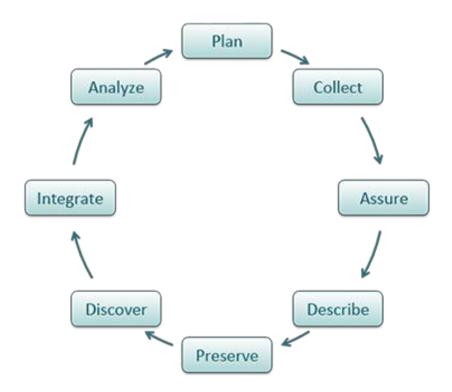






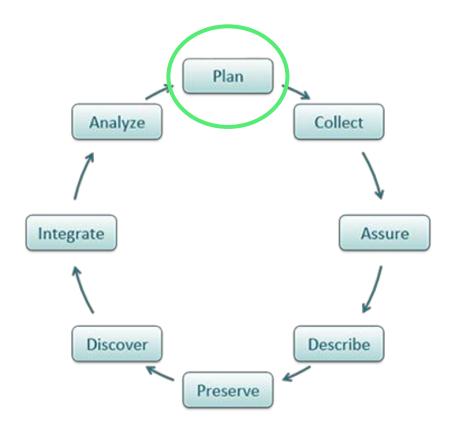


The Data Life Cycle





The Data Life Cycle



https://www.dataone.org/best-practices











Engagement







Engagement



Stay Organized







Engagement



Efficiency



Funder Requirement

Stay Organized





Efficiency

Funder Requirement





Share data



What's in a Data Management Plan?

- Study design
- Data (including format)
- Metadata
- Policies for access, sharing & reuse
- Long-term storage & data management
- Budget





1. Engage your team





- 1. Engage your team
- 2. Plan from the start





- 1. Engage your team
- 2. Plan from the start
- 3. Follow good advice
 - Arctic Data Center
 - Institutional Libraries
 - DataONE





- 1. Engage your team
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 - Arctic Data Center
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 - DataONE
- 4. Use good tools
 - DMPTool
 - DMPOnline





- 1. Engage your team
- 2. Plan from the start
- 3. Follow good advice
 - Arctic Data Center
 - Institutional Libraries
 - DataONE
- 4. Use good tools
 - DMPTool
 - DMPOnline
- 5. Review and Revise



10 Simple Rules for Writing a Good DMP



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PERSPECTIVE

Ten Simple Rules for Creating a Good Data Management Plan

William K. Michener

Published: October 22, 2015 https://doi.org/10.1371/journal.pcbi.1004525

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Introduction

Rule 1: Determine the Research Sponsor Requirements

Rule 2: Identify the Data to Be Collected

Rule 3: Define How the Data Will Be Organized

Rule 4: Explain How the

Figures



Check for updates

Included in the Following Collections

Ten Simple Rules Open Data

1!



10 Simple Rules for Writing a Good DMP

- 1. Determine the research sponsor requirements
- 2. Identify the data to be collected
- 3. Define how the data will be organized
- 4. Explain how the data will be documented
- 5. Describe how quality data will be assured
- 6. Present a sound storage & preservation strategy
- 7. Define the project's data policies
- 8. Describe how the data will be disseminated
- 9. Assign roles & responsibilities
- 10. Prepare a realistic budget



Determine the research sponsor requirements









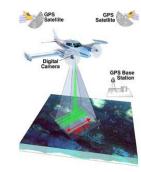




Identify the data to be collected: types; sources; volume; and data and file formats

















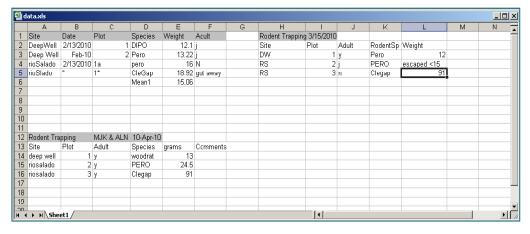
Define how the data will be organized

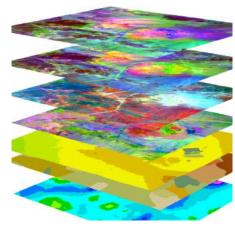








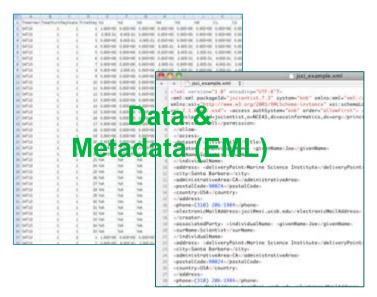


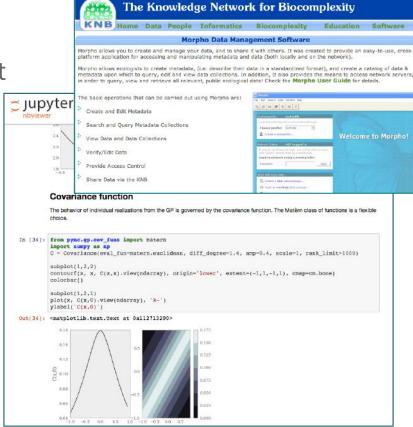




Explain how the data will be documented

- Dublin Core, ISO 19115, EML
- Morpho, metavist, readme.txt
- Electronic notebooks

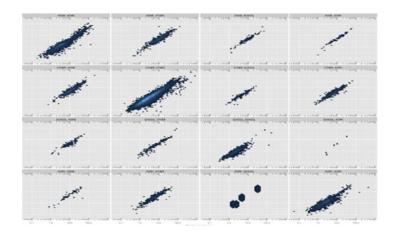






Describe how data quality will be assured

Training activities, instrument calibration and verification tests, double-blind data entry, and statistical and visualization approaches to error detection







Present a sound data storage and preservation strategy

- How long will the data be accessible?
- How will data be stored and protected during the project?
- How will data be preserved and made available for future use?









Define the project's data policies

- Licensing and data sharing arrangements
- Human subject and other sensitive data







Describe how the data will be disseminated

More active, robust and preferred approaches include: (1) publishing the data in an open repository or archive; (2) submitting the data as appendices or supplements to journal articles; and (3) publishing the data, metadata, and relevant code as a "data paper".







GitHub



Assign roles and responsibilities

 Roles may include data collection, data entry, QA/QC, metadata creation and management, backup, data preparation and submission to an archive, and systems administration.





Prepare a realistic budget

 Review your plan and make sure that there are lines in the budget to support the people that manage the data as well as pay for the requisite hardware, software





Find Research Funder Requirements

- NSF
 - NSF 14-1, Grantee Standards, Section j
 (https://www.nsf.gov/pubs/policydocs/pappguide/nsf14001/gpg_2.jsp#IIC2j)
- NSF GEO
 - Directorate for Geosciences--Data Policies (https://www.nsf.gov/geo/geo-data-policies/)
- NSF Polar Programs
 - NSF 16-055 Dear Colleague Letter
 (https://www.nsf.gov/pubs/2016/nsf16055/nsf16055.jsp)
- Check your funder for specific requirements



NSF Division of Polar Programs

- NSF requires submission to the Arctic Data
 Center within 2 years
 - AON program requires submission within 6 months
- Need to document your data well enough for reuse
- There are exceptions for sensitive data
 - Social sciences, endangered species



- Products of research
 - Types of data, samples, physical collections, software, curriculum materials, other materials produced during project



Products of research

 Types of data, samples, physical collections, software, curriculum materials, other materials produced during project

Data formats and standards

 Standards to be used for data and metadata format and content (for initial data collection, as well as subsequent storage and processing)



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Policies and provisions for re-use

Including re-distribution and the production of derivatives



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Policies and provisions for re-use

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Archiving of data

Plans for archiving data, samples, research products and for preservation of access



DMP Tools & Resources Online





https://dmponline.dcc.ac.uk/





DMPTool by the Numbers



29,887 Users



26,353 Plans



234
Participating institutions More

Top 5 templates

Digital Curation Centre

NSF-SBE: Social, Behavioral, Economic Sciences

NIH-GDS: Genomic Data Sharing

NIH-GEN: Generic

NEH-ODH: Office of Digital Humanities



Hands-On: Create a DMP

Login or create a DMPTool account (https://dmptool.org/)

Draft your own Data Management Plan







DMPTool by the Numbers



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Participating institutions More

Top 5 templates

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Sign in options

Option 1: If your institution is affiliated with DMPTool.

Your institution

- or -

Option 2: If your institution is not affiliated with DMPTool.

Email address

- or -

Option 3: If not affiliated and you need an account.

Create account with email address

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Sign in -



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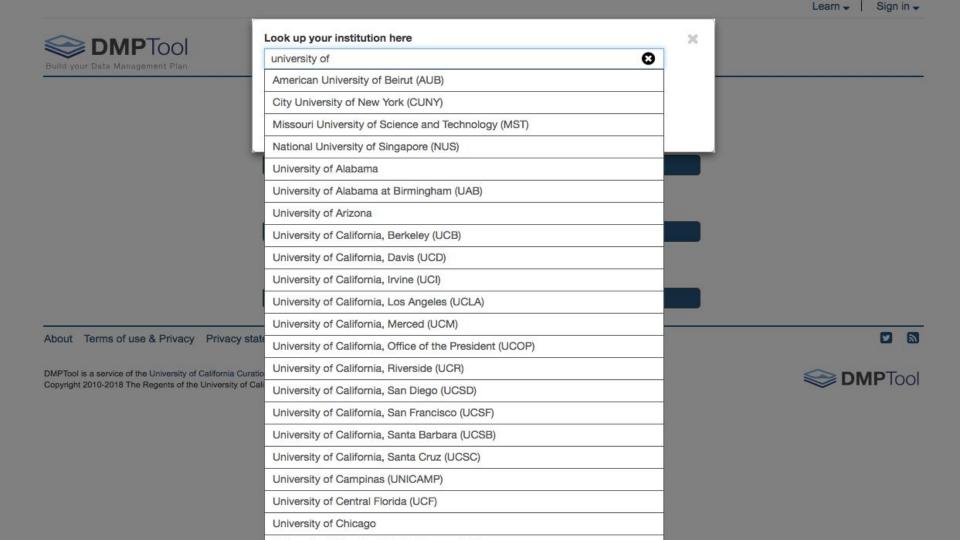
Create account with email address

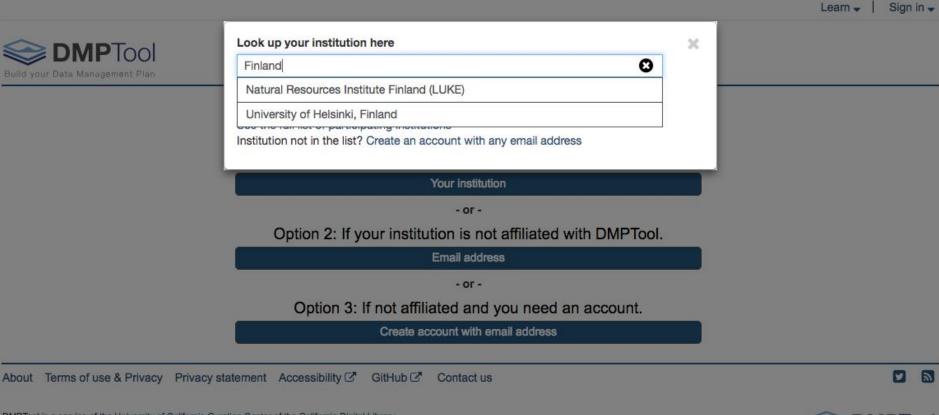
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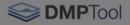






our Data Management Plan	* First name	* Last name	8	
	* Email			
	* Password			
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Notice: Welcome! You have signed up successfully.

My dashboard

Create plan

Welcome

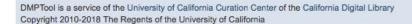
You are now ready to create your first data management plan. Click the 'Create plan' button to begin.

There are no records associated

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Create plan





My dashboard Create plan

Notice: Welcome! You have signed up successfully.

My dashboard

Welcome

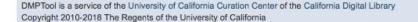
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Promote the DMPTool

FAQ

Notice: Welcome! You have signed up successfully.

Create plan

My dashboard

My dashboard

Welcome

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Create plan

Create plan





Kathryn Meyer -

Create plan



My dashboard Create plan Funder Requirements Public Plans Participating institutions

FAQ

For researchers Quick start guide Data management general guidance For Administrators 7

Promote the DMPTool

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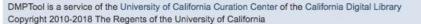
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Create plan







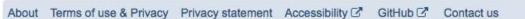
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There are no records associated



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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?	
	 Mock project for testing, practice, or educational purposes

Select the primary research organization

Begin typing to see a filtered list

- or -

My research organisation is not on the list or no research organisation is associated with this plan

Select the primary funding organization

Begin typing to see a filtered list - or - No funder associated with this plan

Create plan Cancel

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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? If applying for funding, state the project title exactly as in educational purposes the proposal. Select the primary research organization

Begin typing to see a filtered list My research organisation is not on the list or no research organisation - or is associated with this plan

Contact us

Select the primary funding organization

Begin typing to see a filtered list No funder associated with this plan - or -

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What research project are you planning? Arctic Data Center DMP Demo Mock project for testing, practice, or educational purposes Select the primary research organization Begin typing to see a filtered list My research organisation is not on the list or no research organisation is associated with this plan Select the primary funding organization National Science Foundation (NSF) 0 No funder associated with this plan Which template would you like to use? We found multiple templates corresponding to your funder. Arctic Data Center: NSF Polar Programs [DRAFT] Create plan Cancel About Terms of use & Privacy Privacy statement Accessibility ✓ GitHub 🖸 Contact us



Project details	Plan overview	Write plan	Share	Download
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Principal Name	Investigator			
Kathryn Me	yer			
ORCID ID				
Email				
meyer@nce	eas.ucsb.edu			
Data cont	tact person			
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To help you write your plan, DMPTool can show you guidance from a variety of organizations.

Select up to 6 organizations to see their guidance.



Find guidance from additional organizations below

See the full list



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Project details	Plan overview	Write plan	Share	Download
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Kathryn Mey	yer			
ORCID ID				
Email				
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Submit

Briefly summarize your research project to help others understand the purposes for which the data are being collected or created.



	Plan overview	Write plan	Share	Download
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DMPTool

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See the full list

Arctic Data Center DMP Demo

Project details Plan overview Write plan

Download

Arctic Data Center: NSF Polar Programs [DRAFT]

This plan is based on the "Arctic Data Center: NSF Polar Programs [DRAFT]" template provided by National Science Foundation (NSF).

Instructions

Types of data produced

- What types of data, samples, collections, software, materials, etc. will be produced during your project?
- What will be the approximate number and size of data files that will be produced during your project?

Share

- What type of metadata (information others might need to use your data) will be collected during your project?
- Note: if you plan to submit data to the Arctic Data Center please refer to the guidance in the panel on the right.

Data and metadata formats

What format(s) will data and metadata be collected, processed, and stored in?

Note: if you plan to submit data to the Arctic Data Center please refer to the guidance in the panel on the right.

Roles and responsibilities

- 1. What parties and individuals will be involved with data management in this project?
- 2. What will be the roles and responsibilities of each party and or individual with respect to management of the data
- 3. Who will be the lead or primary person responsible for ultimately ensuring compliance with the Data Management Plan?

Note: if you plan to submit data to the Arctic Data Center please refer to the guidance in the panel on the right.

Policies for access and sharing

 Will any of the data and/or related materials produced need provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements? If so describe them and detail any requested exceptions from the archiving requirements set for Arctic Sciences research.

Write plan

- How will date he appeared and shared during the course of the project?

Arctic Data Center DMP Demo

Project details Plan overview Write plan Share Download

Arctic Data Center: NSF Pox Programs [DRAFT]

This plan is based on the "Arctic Data Center: NSF Programs [DRAFT]" template provided by National Science Foundation (NSF).

Instructions

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Write plan

62

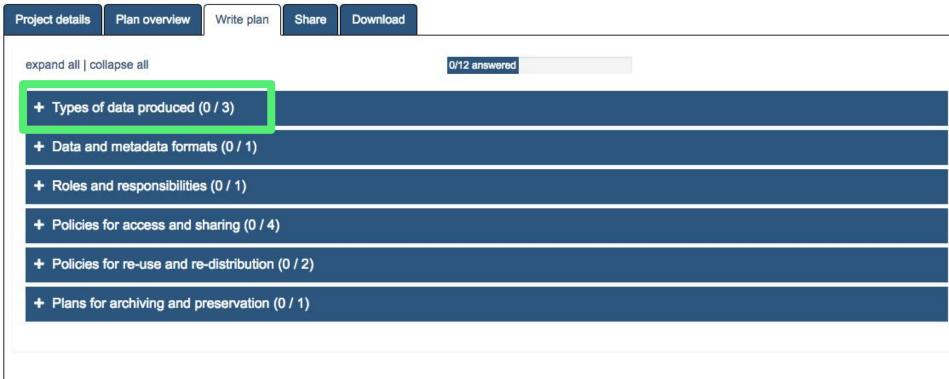


Arctic Data Center DMP Demo

Project details	Plan overview	Write plan	Share	Download	
expand all co	llapse all				0/12 answered
+ Types of	data produced ((0 / 3)			
+ Data and	d metadata forma	ats (0 / 1)			
+ Roles ar	nd responsibilities	s (0 / 1)			
+ Policies	for access and s	haring (0 / 4)			
+ Policies	for re-use and re	-distribution	(0 / 2)		
+ Plans for	r archiving and p	reservation (0 / 1)		



Arctic Data Center DMP Demo



Types of data produced (0 / 3)		
What types of data, samples, collections, software, materials, etc. will be produced during your project?	Guidance	Comments
B	NSF DMPTool Guidance	
NSF example answer		
The researchers will collect and record (Enter data types here. Examples are conductivity, temperature, and depth (CTD) data, gas flux data, aerial photos, modeled atmospheric data, etc.)		
These data will include the variables (Enter data variables here. Examples are water temperature, water salinity, photosynthetically active radiation, methane flux, soil albedo, etc.)		
Additional data products that will be made available include (Enter additional products here. Examples are atmospheric model codes, educational materials, etc.)		

What will be the approximate number and size of data files that will be produced during your project?

Guidance Comments

- Types of data produced (0 / 3)

What types of data, samples, collections, software, materials, etc. will be produced during your project?



Save

NSF example answer

The researchers will collect and record ______. (Enter data types here. Examples are conductivity, temperature, and depth (CTD) data, gas flux data, aerial photos, modeled atmospheric data, etc.)

These data will include the variables _____. (Enter data variables here. Examples are water temperature, water salinity, photosynthetically active radiation, methane flux, soil albedo, etc.)

Examples are atmospheric model codes, educational materials, etc.)

Additional data products that will be made available include _____. (Enter additional products here.

What will be the approximate number and size of data files that will be produced during your project?

Guidance Comments

- Data and metadata formats (0 / 1)

What format(s) will data and metadata be collected, processed, and stored in?

Note: if you plan to submit data to the Arctic Data Center please refer to the guidance in the panel on the right.

I	

Save

NSF example answer

_____ data will be collected in ______. (Examples are handwritten lab notebooks, Microsoft Excel files, CSV files, R scripts, etc. Make sure to specify the collection format for each type of data detailed in your description of data.)

All data will be transferred into the following formats for processing and storage: ______. (Examples are CSV files, NetCDF files, etc.)

Metadata will be collected in ______ . (Examples are handwritten lab notebooks, Microsoft Word files, etc.)

All metadata will be transformed from text into EML files by the Arctic Data Center online submission tool when submitting to the Arctic Data Center.

Guidance Comments

NSF DMPTool

Guidance

Arctic Data Center Data Format Policy: The Arctic Data Center primarily supports the upload of open-source, ubiquitous, and easy-to-read data formats. Examples of such formats are Comma Separated Values (CSV) files, text (TXT) files, PNG, JPEG or TIFF image files, and NetCDF files among many others. If you plan to submit to the Arctic Data Center, include your planned methods to create open-source. ubiquitous, and easy-to-read data. If you plan to work with any proprietary data formats such as Excel workbooks or MATLAB files, please include a plan to transform all data stored in these formats into an open-source format before submission to the Arctic Data Center. If you anticipate any data will not be able to be transformed into an open-source format, please provide your reasoning.

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Save

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Roles and responsibilities (0 / 1)

- 1. What parties and individuals will be involved with data management in this project?
- 2. What will be the roles and responsibilities of each party and or individual with respect to management of the data
- 3. Who will be the lead or primary person responsible for ultimately ensuring compliance with the Data Management Plan?

Note: if you plan to submit data to the Arctic Data Center please refer to the guidance in the panel on the right.



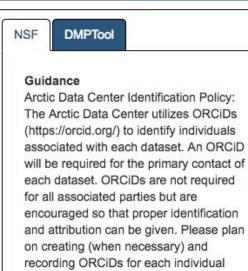
Save NSF example answer

The following organizations and individuals will be involved with data management in this project:

____ will be responsible for _____. (Examples are collecting data, maintaining data storage and backup systems, interfacing with data repository personnel, etc. Make sure to specify the responsibilities for each organization/individual detailed above.)

The NSF Arctic Data Center will provide data archival, preservation, access and metadata authoring services for the project.

Guidance Comments



involved with your project before

submitting to the Arctic Data Center.

- Policies for access and sharing (0 / 4)

Will any of the data and/or related materials produced need provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements? If so describe them and detail any requested exceptions from the archiving requirements set for Arctic Sciences research.



Save

NSF example answer

of privacy, confidentiality, security, intellectual property, or other specify all the types of data that are expected to need provisions	[1] 프라마스 (12 B. 19 P. 1
data are expected to need provisions due to release of indigenous knowledge, etc. Make sure to specify expl detailed above.)	(Examples are ethical restrictions lanations for all expected provisions
Because of these expected provisions, it is expected that the archiving requirements set for Arctic Sciences research.	data will need to be exempted from

data are expected to need provisions for ______. (Examples are appropriate protection

Guidance Comments

NSF DMPTool

Guidance

- NSF Office of Polar Programs Guidelines
- Arctic Data Center Guidelines on who must submit

Policies for re-use and re-distribution (0 / 2)

of data detailed in your description of data.)

How do you anticipate the data for this project will be used? Consider the following:

- 1. Which bodies/groups are likely to be interested in the data?
- 2. What and who are the intended or foreseeable uses/users of the data?



Other groups that may be interested in _____ data are _____. (Examples are academic researchers, government agencies, non-profit organizations, etc. Make sure to specify interest

Guidance Comments

NSF DMPTool

Guidance

Will any permission restrictions need to be placed on the data? Consider the following:

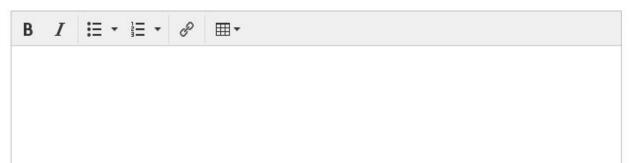
expectations for each type of data detailed in your description of data.)

Plans for archiving and preservation (0 / 1)

What is the long-term strategy for maintaining, curating, and archiving the data?

Note: The Office of Polar Programs policy requires that metadata files, full data sets, and derived data products be deposited in a long-lived and publicly accessible archive.

Note: if you plan to submit data to the Arctic Data Center please refer to the guidance in the panel on the right.



Save

NSF example answer

The data manager will follow the NSF Arctic Data Center guidelines to provide accurate and complete documentation for data preservation. The NSF Arctic Data Center will ensure that the data are curated in a relevant long-term archive and ensure data will be available after project funding has ended.

Guidance Comments

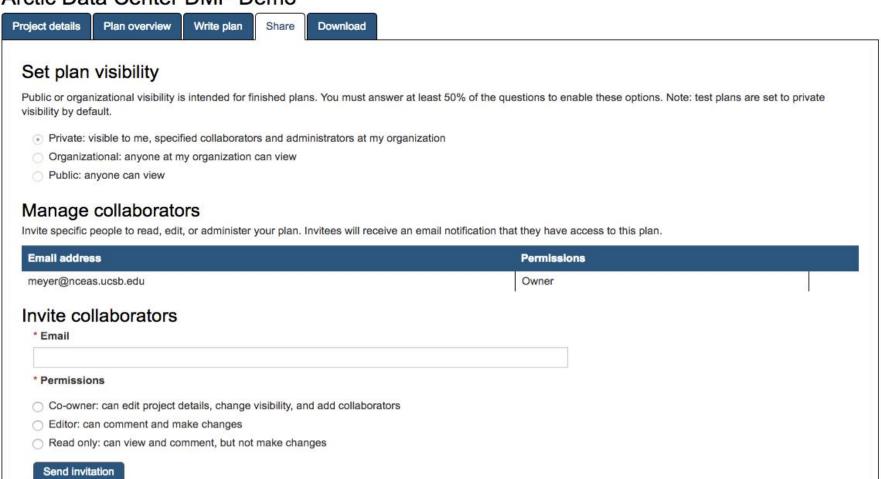
NSF DMPTool

Guidance

Arctic Data Center Data Preservation
Policy: The Arctic Data Center ensures
the long-term preservation of the data
entrusted to the repository. The guiding
principles for the preservation plan
follow:

- 1. Preserve the bits
- 2. Open science, open standards
- 3. Replicate data and metadata
- 4. Strong versioning
- 5. Frequent auditing
- 6. A wind down plan

Arctic Data Center DMP Demo



Arctic Data Center DMP Demo







Public Plans

Public plans are plans created using the DMPTool service and shared publicly by their owners. They are not vetted for quality, completeness, or adherence to funder guidelines.

Q Search

Project title ♦	Template ≑	Organization	Owner	Download
UNDERSTANDING THE ROLE OF PHYSICIAN INTEGRATION WITHIN NURSING HOMES IN POST-ACUTE CARE OUTCOMES	NIH-GEN: Generic	University of Pennsylvania (UPenn)	Kira Ryskina	PDF
"A Microgravity-Themed Collaborative Intervention Promoting Student Selection of a STEM Career Pathway"	NSF-EHR: Education and Human Resources	Baylor University	Stacey Smith	PDF
A Framework for Adaptive Sampling of Social Science Research Data Using the Twitter API: Understanding Social Media Communication During Crisis Events	NSF-SBE: Social, Behavioral, Economic Sciences	University of California, Davis (UCD)	Carl Stahmer	PDF
A Political Ecology of Value: A Cohort-Based Ethnography of the Environmental Turn n Nicaraguan Urban Social Policy	NSF-SBE: Social, Behavioral, Economic Sciences	Non Partner Institution	Josh Fisher	PDF
A unified approach to preserving cultural software objects and their development histories	NEH-ODH: Office of Digital Humanities	University of California, Office of the President (UCOP)	DMP dmpcurator	PDF
A unified approach to preserving cultural software objects and their development histories	NEH-ODH: Office of Digital Humanities	University of California, Los Angeles (UCLA)	Christopher Cabrera Thompson	PDF
Additive Manufacturing for Spare Parts Supply Chain	NSF-ENG: Engineering	University of Tennessee, Knoxville	Nawei Liu	PDF
analysis of Brazilian financial investment funds CVM - Escola Politécnica - PPGEE - PCS	Department of Energy (DOE): Generic	Non Partner Institution	Antonio Newton Licciardi Jr	PDF
AR or HAI Data Management Plan	NSF-EAR: Earth Sciences	Emory University	Scott Fridkin	PDF
Arthropod responses to grassland nutrient limitation	NSF-GEN: Generic	University of California, Office of the President (UCOP)	DMP dmpcurator	PDF

View all 1 2 3 4 5 ... Next Last



DMPTool Community Resources



Release notes: Templates and more



Posted on June 1, 2018 by stephaniesimms

The Roadmap development team just finished a huge chunk of work that we rolled out to DMPTool users this week. Prior to launching the new version of the tool we focused on optimizing the primary user side: creating DMPs. With this new release, we've made significant improvements to the administrative side, specifically to overhaul the way admins create and version templates.

In the midst of this major refactoring effort, we did some additional maintenance, upgrades, and accepted the first new feature contribution from our French partners at DMP OPDoR (many thanks to Benjamin and Quentin!). The full release notes are available on GitHub. Most of the magic takes place behind the scenes, but keep reading for a summary of changes that affect the user interface.

• Templates: You'll notice some subtle changes as you create, edit, and update templates and customizations for funder templates. Previously, any changes you made to a template would trigger a new version. Now you can make changes to template details (Title, Description, update broken links) without versioning. Any structural changes, such as adding a new question or example answer or adding customized guidance to a funder template will create a new version. In the main templates table you will see a red editing icon (screenshot below) if you've made changes that created a new version. The icon includes a tooltip that alerts you to publish your changes (in the Actions menu) in order to make them available to users. You can always "Unpublish" templates and customizations at any time. You will only see the option to "Remove" (i.e. from the table/from view) a template that has not been used to create any plans (e.g. test templates) or a customization that has not been previously published. Detailed instructions are available in the Help for Administrators.



Summary

- Good data management plans will save you time and effort overall
- Data management plans are not static revise as you do your research project
- Take advantage of DMP resources to create your plan
- The Arctic Data Center is available to assist with your DMP development