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NSF Data Management Requirements 101

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NSF Data Management Requirements 101

http://georgiasouthern.libguides.com/data
National Science Foundation (NSF)

- $7.5 billion budget (FY 2016).
- Funds ~24% of all federally supported basic research conducted by America's colleges and universities.
- Awards ~12,000 limited-term grants annually, most to individuals or small groups of investigators.
- Funds specific research proposals judged the most promising by a “rigorous and objective” merit-review system...

http://www.nsf.gov/about/glance.jsp
National Science Foundation (NSF)

Composed of several disciplinary directorates, including:

- Biological Sciences
- Computer & Information Science & Engineering
- Engineering
- Geosciences
- Mathematical & Physical Sciences
- Social, Behavioral & Economic Sciences

http://www.nsf.gov/staff/orglist.jsp
Merit Review

Review criteria defined in *Grant Proposal Guide* (GPG):

- **Intellectual Merit**: Potential to advance knowledge; and
- **Broader Impacts**: Potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

“When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and **what benefits could accrue if the project is successful**. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions.”

“The Administration is committed to ensuring that, to the greatest extent and with the fewest constraints possible and consistent with law and the objectives set out below, the direct results of federally funded scientific research are made available to and useful for the public, industry, and the scientific community. Such results include peer-reviewed publications and digital data.”

“The ... (OSTP) hereby directs each Federal agency with over $100 million in annual conduct of research and development expenditures to develop a plan to support increased public access to the results of research funded by the Federal Government.”
NSF’s Public Access Plan: 
*Today’s Data, Tomorrow’s Discoveries* (Mar. 2015)

- Articulates NSF’s roadmap for meeting OSTP’s requirements, including:
  - Scope and definition of scholarly products covered (§2)
  - Requirements for peer-reviewed publications (§3.1)
  - Requirements for research data, including inclusion of a data management plan (DMP) with all applications (§3.2)
- Provides general requirements, which may be nuanced by the directorates, offices, etc. as appropriate for different research communities.
Research Data Defined

“As defined in the 2 CFR 200.315(e)(3): 5 “the recorded factual material commonly accepted in the scientific community as necessary to validate research findings.”

While the focus is on unclassified digital data as defined in the regulation, NSF understands that additional DMP guidance at the directorate, division, or program levels may include more nuanced criteria, appropriate to the scientific discipline and proposed activity...” (§2)

* Data management requirements are not limited to “interpreted” data appearing in finished publications, but include all data “resulting from the research funded by the award, whether or not the data support a publication.” (§3.2.3)
General Requirements

Sharing Policy:

“Investigators are expected to share with other researchers, at no more than incremental cost and within a reasonable time, the primary data, samples, physical collections and other supporting materials created or gathered in the course of work under NSF grants. Grantees are expected to encourage and facilitate such sharing.”
DMP Requirement:

“Proposals... must include a supplementary document of no more than two pages labeled “Data Management Plan”. This supplementary document should describe how the proposal will conform to NSF policy on the dissemination and sharing of research results.”
General Requirements

DMP Contents:

“This supplementary document may include:

1. the types of data, samples, physical collections, software, curriculum materials, and other materials to be produced in the course of the project;
2. the standards to be used for data and metadata format and content (where existing standards are absent or deemed inadequate, this should be documented along with any proposed solutions or remedies);
3. policies for access and sharing including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements;
4. policies and provisions for re-use, re-distribution, and the production of derivatives; and
5. plans for archiving data, samples, and other research products, and for preservation of access to them.”
General Requirements

Directorate-Level Guidance:

“If guidance specific to the program is not provided, then the requirements established in Grant Proposal Guide, Chapter II.C.2.j apply.”

“If a specific program solicitation provides guidance on preparation of data management plans, such guidance must be followed.”
General Requirements

Collaborative Proposals & Subawards:

“Simultaneously submitted collaborative proposals and proposals that include subawards are a single unified project and **should include only one supplemental combined Data Management Plan**, regardless of the number of non-lead collaborative proposals or subawards included.”
General Requirements

DMP Review:

“A valid Data Management Plan may include only the statement that no detailed plan is needed, as long as the statement is accompanied by a clear justification.

Proposers who feel that the plan cannot fit within the limit of two pages may use part of the 15-page Project Description for additional data management information. Proposers are advised that the Data Management Plan must not be used to circumvent the 15-page Project Description limitation.

The Data Management Plan will be reviewed as an integral part of the proposal, considered under Intellectual Merit or Broader Impacts or both, as appropriate for the scientific community of relevance.”
General Requirements

Data Deposit and Citation:

“Data that underlie the findings reported in a journal article or conference paper should be deposited in accordance with the policies of the publication and according to the procedures laid out in the DMP included in the proposal that led to the award on which the research is based...

All data resulting from the research funded by the award, whether or not the data support a publication, should be deposited at the appropriate repository as explained in the DMP. Metadata associated with the data should conform to community standards and the requirements of the host repository. At a minimum, data elements should include acknowledgement of NSF support as well as the award number and appropriate attribution.”
Embargos and Protected Classes:

Practices governing use of embargos and delayed data release vary widely across the research communities supported by NSF and should be discussed as part of the DMP.

For large-scale projects that are supported primarily to generate data for community use, the timing of release will be part of the award terms and conditions and clearly stated in the public award abstracts.

NSF recognizes that some classes of data, particularly those that relate to human subjects, education, personally identifiable information, national security, or proprietary interests, may be subject to restrictions. Such restrictions must be described in the DMP and changes addressed in annual and final reports.
General Requirements

Associated Costs:

“NSF allows proposers to request funds for the ”costs of documenting, preparing, publishing or otherwise making available to others the findings and products of the work conducted under the grant. This generally includes the following types of activities: reports, reprints, page charges or other journal costs (except costs for prior or early publication); necessary illustrations; cleanup, documentation, storage and indexing of data and databases; development, documentation and debugging of software; and storage, preservation, documentation, indexing, etc., of physical specimens, collections or fabricated items” (see Grant Proposal Guide, Chapter II.C.2.g.vi.(b)).”
Basic DMP Elements...

1. Types of data, samples, physical collections, software, curriculum materials, and other materials to be produced in the course of the project.

- What data will be generated in the research?
- What data types will you be creating or capturing?
- How will you capture or create the data?
- If you will be using existing data, state this and include how you will obtain it.
- What is the relationship between the data you are collecting and any existing data?
- How will the data be processed?
- What quality assurance & quality control measures will you employ?
Basic DMP Elements...

2. Standards to be used for data and metadata format and content (where existing standards are absent or deemed inadequate, this should be documented along with any proposed solutions or remedies).

- Which file formats will you use for your data, and why?
- What form will the metadata describing/documenting your data take?
- How will you create or capture these details?
- Which metadata standards will you use and why have you chosen them? (e.g. accepted domain-local standards, widespread usage)
- What contextual details (metadata) are needed to make the data you capture or collect meaningful?
3. Policies for access and sharing: Provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements.

- How will you make the data available? (Include equipment, systems, expertise, etc.)
- When will you make the data available?
- What is the process for gaining access to the data?
- Will access be chargeable?
- How long will the original data collector/creator/principal investigator retain the right to use the data before making them available for wider distribution?
- Are there any embargo periods for political/commercial/patent reasons?
- Are there ethical and privacy issues? If so, how will these be resolved?
- What have you done to comply with your obligations in your IRB Protocol?
- Who will hold the intellectual property rights and how might this affect access?
Basic DMP Elements...


- Will any permission restrictions need to be placed on the data?
- Who is likely to be interested in the data?
- What and who are the intended or foreseeable uses the data?
5. Plans for archiving data, samples, and other research products, and for preservation of access to them.

- What is the long-term strategy for maintaining the data?
- Which archive/repository/database have you identified to deposit the data?
- What procedures does your intended long-term data storage facility have in place for preservation and backup?
- How long will/should data be kept beyond the life of the project?
- What data will be preserved for the long-term?
- What transformations will be necessary to prepare data for preservation?
- What metadata/documentation will be submitted alongside the data or created on deposit/transformation in order to make the data reusable?
Directorate-Level Requirements

Search DMPTool’s DMP Requirements Library:

https://dmptool.org/guidance
DMPTool & Example DMPs

For DMPTool or to use the library’s generic DMP template, visit the Data Management Services Guide at:

http://georgiasouthern.libguides.com/data/DMPTool

For Sample DMPs, see our collection at:

http://georgiasouthern.libguides.com/data/exampleDMPs
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