

Data Management Plans & LaTeX

EEOB/BCB 546X

October 23, 2019

Data Management Plans

Reproducible Research

Biological Data

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Research Products

In addition to data, biology research also yields other products that are necessary for reproducibility and are tools that can advance the field (e.g., software, scripts, databases, tutorials).

Planning for Data

Write it down

A **Data Management Plan** is a written plan for dealing with scientific data and all of the products of a research project. This plan accounts for how data (and software, tools, etc.) will be handled during a research project and *after* the project is completed.

Proposing Reproducible Research

White House Mandate

In 2013 a **mandate from President Obama** required that results of all federally funded research be made publicly available and that these funding agencies develop plans for data management. (The links to these mandates are no longer available on the White House website. Nevertheless, funding agencies persist in requiring DMPs.)

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DMPs are required for funding

NSF, NIH, USDA, NASA, DOE, HHS, CDC, FDA, NIST, NOAA, USAID, AHRQ etc.

These and many other funding agencies require data management plans for all proposed research projects and/or awards.

Requirements of Data Management Plans

Suggested Standards

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- **roles & responsibilities:** which members of the project will carry out components of the DMP

NSF Data Management Plan

Recommended Standards from the DPMTool Template

Data and Materials Produced

- Describe the types of data, physical samples or collections, software, curriculum materials, and other materials to be produced in the course of the project. (For collaborative proposals, the DMP must cover all the various data types being collected by each collaborator.)

Standards, Formats and Metadata

- Describe the standards to be used for all the data types anticipated, including data or file format and metadata. [Note: Where existing standards are absent or deemed inadequate, this should be documented along with any proposed solutions or remedies.]

Roles and Responsibilities

- Describe the roles and responsibilities of all parties with respect to the management of the data (including contingency plans for the departure of key personnel from the project).

Dissemination Methods

- Describe the dissemination methods that will be used to make data and metadata available to others during the period of the award, and any modifications or additional technical information regarding data access after the grant ends.

Policies for Data Sharing and Public Access

- Describe the PI's policies for data sharing, public access and re-use, including re-distribution by others and the production of derivatives. Where appropriate, include provisions for protection of privacy, confidentiality, security, intellectual property rights and other rights.

Archiving, Storage and Preservation

- Where relevant, describe plans for archiving data, samples, software, and other research products, and for on-going access to these products through their lifecycle of usefulness to research and education. Consider which data (or research products) will be deposited for long-term access and where. (What physical and/or cyber resources and facilities (including third party resources) will be used to store and preserve the data after the grant ends?)

Examples of Data Management Plans

NSF-BIO Projects

NSF DEB-1556615/DEB-1556701

The DMP for a collaborative award entitled: *Advancing Bayesian Phylogenetic Methods for Synthesizing Paleontological and Neontological Data*

- Overleaf URL: <http://bit.ly/2KxWJVq>

NSF IOS-1546719

The DMP for a collaborative award entitled: *The Genetics of Highland Adaptation in Maize*

- Overleaf URL (entire proposal): <http://bit.ly/2o6NR0K>

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What are important data management issues for your research?

Think about your own work and the data you collect, how would you craft a DMP for your project?

- data type, data format, data storage & preservation, data sharing, publishing & dissemination, roles & responsibilities

Assignment: Write a DMP

Due: November 6, 2019

Write a DMP for your research based on the NSF requirements.

L^AT_EX for Typesetting

The intention of this lesson is mainly to give you an introduction to L^AT_EX so that you understand the benefits of using a typesetting system for creating documents.

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L^AT_EX

In 1985 Leslie Lamport released L^AT_EX, which is a set of macros for document preparation that uses the T_EX typesetting program and language.

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- you are required to use it for many documents as an academic

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- it is not for everyone ☹

How do Researchers Use L^AT_EX

Some Examples

L^AT_EX is useful for many types of documents including journal articles, grant proposals, and presentations (like these slides!). Let's look at a few of these.

- a scientific manuscript
- a CV
- a presentation

Thesis Template

Iowa State has a L^AT_EX [template for writing your graduate thesis](#).

Download LaTeX

<https://www.latex-project.org/get>

LaTeX Interactive Development Environments

TeX distributions often come with free LaTeX IDEs that allow you to compose and compile documents. There are also many nice 3rd party products (though many are not free).

- LyX (offers a WYSIWYMean environment)
- TeXMaker
- TeXPad (Mac OS X)

Online \LaTeX Tools

Web-based \LaTeX editors

In the last several years, collaborating online with \LaTeX has gotten easier and easier with web-tools.

- Overleaf (<https://www.overleaf.com>)
- LaTeX Base (<https://latexbase.com>)
- Papeeria (<https://papeeria.com>)
- Authorea (<https://www.authorea.com>)

Let's get started!